

P I N K D I S E A S E .

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by

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P I N K D I S E A S E .

Introductory:

Pink Disease is a most distressing condition which affects babies and very young children. It is only since the Great War that its existence has dawned on the medical horizon, and in most parts of the British Isles its incidence seems to be rare. However in certain industrial areas of the North of England it is relatively common, and the opportunities for its study are not so limited.

The appalling misery of the little sufferers makes a very definite impression upon anyone who has a case of Pink Disease under his or her care, and one feels that the present day ignorance of its problems is sufficient justification for this thesis.

The disease is characterised by a complete change in disposition from that of a normal happy child to one of absolute misery; this is accompanied by insomnia, irritability and a disinclination for food. At some time in its course a generalised rash appears on the body, the hands and feet become swollen, cold and clammy, and assume a colour which varies from a light pink to a deep cyanotic red. These changes are followed by desquamation, which may be general, but is always most evident on the hands and feet.

Drenching perspirations are the rule during the /

the early stages; salivation with ulcerative changes in the mouth is common; photophobia is very obvious in most cases.

There is a very striking tachycardia always present. As the disease progresses muscular wasting and hypotonia become marked, and considerable loss of weight is the rule. There may be alterations in the deep reflexes.

The clinical picture is not complete in every case, and certain symptoms or signs may be absent; but it reproduces itself with astonishing accuracy, and forms a symptom-complex that, once seen, cannot well be forgotten.

Historical - Nomenclature.

The first account of the disease would appear to have been given by SELTER in 1903. He reported eight cases at a Medical Society in Cassel (Germany) which he called "Trophodermatoneurosen". There he described the disease as it is known to-day fairly accurately, but did not mention the muscular changes, the tachycardia, or the raised blood pressure, to which Feer later drew attention. One or two of Selter's cases have been regarded as doubtful owing to the predominance of cerebral symptoms. This contribution was not published and escaped notice till Selter himself drew attention to it in an article published twenty-four /

twenty-four years later.

SWIFT of Adelaide is given general priority in the description of the condition. He read a paper at the Tenth Session of the Australasian Medical Congress at Auckland, New Zealand, in 1914, in which he described fourteen cases in children of between six and sixteen months. He gave it the name of Erythroedema, based on the typical red swollen condition of the hands and feet. As we shall see later, this term was not strictly accurate, as there is no true oedema of the extremities.

The Great War came along to damp the interest this paper had aroused in Australia, but Swift showed a case at a meeting of the South Australian branch of the B.M.A. in 1917, and a short note was published in the Medical Journal of Australia. This evoked a comment in the Lancet (1918), where Swift's description was quoted. He gave a good deal of prominence to digestive disturbances at the onset, stressing the anorexia and a tendency to diarrhoea.

Later in 1918 Doak of Bradford wrote to the Lancet saying that he had observed the condition there, but gave only a meagre account of three cases, which all had a positive Wassermann and must be regarded as doubtful.

Meanwhile from America descriptions of a strange new disease were beginning to be made.

In 1917, at the 68th Session of the American Medical /

Medical Association in New York, BYFIELD read a paper to the section of diseases of children, entitled "A series of Trophoneuroses probably due to infection".

BILDERBACK collected eight cases, and they eventually reached WESTON, who published them in 1920 under the name Acrodynia, which had previously been applied to an extraordinary epidemic which devastated Paris in 1828. The latter has since been shown to have been in all probability due to arsenical poisoning affecting the vines. Striking among its symptoms were painful cramps of the hands and feet; hence the term "Acrodynia". Weston thought the new disease which had been brought to his notice was a juvenile form of this.

Later in 1920 BYFIELD published an excellent account of the condition under the heading of "A polyneuritic syndrome resembling pellagra - acrodynia(?) seen in very young children". He gave a very complete clinical description, and drew attention to the sensory and trophic nerve lesions, which he suggested might be a sensory polyneuritis or a post-influenzal radiculitis. He quoted seventeen cases with three deaths.

Returning across the Southern Pacific for a moment, the subject was again discussed at the Australasian Medical Congress in 1920, when JEFFREYS WOOD of Melbourne read a paper which was later published in the Medical Journal of Australia. This was /

was by far the most important contribution to the literature as yet; he gives a classical description, and notes the tendency to sudden unexplained death. With Cole he reported ninety-one cases, seen mostly since 1917, with five deaths.

Wood said he had recognised these cases in Melbourne for thirty years past, and before his time SNOWBALL was aware of the condition, and called the little sufferers "the children with the raw beef hands and feet" - surely an epithet worthy of Homer himself.

In Sydney CLUBBE knew the entity well, and had applied the term "Pink Disease" to it.

Wood in his article retained the term "Erythroedema".

In this country PARKES WEBER described a case, which he considered to be a very severe and prolonged erythroedema, in three different papers published from 1921 to 1922. This case must be considered doubtful, the symptoms being unusually extreme, and lasting from the age of one month to the child's death at $3\frac{1}{4}$.

However THURSFIELD and PATERSON reported an undoubted case early in 1922 under the name "Dermatopolyneuritis", and next year PATERSON and GREENFIELD published their well-known description, calling it then "Erythroedema polyneuritis", which laid emphasis on the pathological changes they described in the spinal cord, nerve roots and peripheral nerves. They reported /

reported five cases in all, and gave detailed pathological reports of two with fatal terminations.

Thus the disease had been described from three different countries, and in each case under a different title. This is exclusive of Selter's early description which was then unknown.

Reports from America became quite numerous following Byfield's contribution. BROWN, COURTNEY and MacLACHLAN published a paper from Toronto in 1921, in which they laid stress on the occurrence of an initial respiratory infection. ZAHORSKY described the disease several times, and Emmerson, Cartin, Field, McNeal, Miller, E.J. Wood, Oliver, Davis, Comby, Bliss, van Bogert, Porter and Lindsay were all early contributors to the literature. VIPOND from Montreal in 1922 claimed to have isolated a diplococcus from enlarged glands, and reported excellent results with a vaccine made from this organism. He published another article in 1926, again strongly advocating this treatment.

In England early writers on the subject were GLEN DAVISON (July 1922) and BRAITHWAITE and PEGGE, while PARSONS showed cases of the disease at Birmingham in 1923.

LITTLEJOHN in Australia made an early contribution.

BILDERBACK gave an excellent account of the disease /

disease in 1925, and other important American papers about this period were those of WARTHIN, who gave a very full pathological study, BUTLER, FOERSTER and RODDA.

BRUTON SWEET of Auckland, N.Z., wrote a paper for an American Journal advocating the use of the mercury vapour quartz lamp in treatment.

In 1923 FEER of Zürich, in ignorance of all descriptions prior to his paper, published an account of a disease affecting very young children, which he termed a "vegetative neurosis". He described six cases, the first of which he had seen as far back as 1911, and there could be no doubt from his very clear picture that Pink Disease and Feer's vegetative neurosis were one and the same. He laid particular stress on the tachycardia and the raised blood pressure.

His paper attracted general attention, and in 1925 he published a second excellent description.

In much the same way, being in ignorance of previous literature on the subject, HAUSHALTER in France reported cases in 1925. He said he had been aware of the condition since 1911.

Thus observers in Australia, America, England, Germany and France had all independently recognised the condition as something entirely new.

Since 1925 references to the disease have multiplied very much, especially from the Continental writers /

writers, and from France and Germany in particular.

In this country important papers have been those of FOWLER, LAPAGE and, very recently, WYLLIE and STERN, who give perhaps the most complete pathological account yet published.

From Switzerland JENNY, MÜLLER and DEUBER have followed in the footsteps of Feer. KELLER, SELTER and ZECHLIN have given comprehensive reviews from Germany. SELTER'S paper in 1927 is of especial interest because of his early description of cases in 1903. He now calls the malady "an infantile paralysis (Kinderlähmung) of the vegetative nervous system".

The French writers on the subject have been very numerous; WORINGER and PÉHU and MESTRALLET have given excellent accounts.

Cases have also been reported from Holland (VAN VEEN, GOUDSMIT and RÜMKE, WIGGELENDAM and KUIPER), Italy (FRANCIONI and VIGI), Poland, Spain and South America.

The only important contribution from North America recently has been that of KERNOHAN and KENNEDY, who made a study of the pathology.

Of great interest is JEFFREYS WOOD'S paper read at the Australasian Congress of 1927; he has had probably a unique experience in the study of what he now graciously calls Swift's Disease .

The nomenclature of this disease is at present /

present controversial. Pink Disease is the popular name in the British Isles, and presumably owes its origin to the colour of the hands and feet. Unfortunately the latter are more often a deep red or a bluish red colour. However, the name has 'caught on'; it has a popular appeal to the imagination, and, one supposes, a certain news-value on the headlines of the popular press.

Swift's original title of Erythroedema has been objected to on the grounds that there is no true oedema, but there is as much justification for the name as there is for that of myxoedema.

The American Acrodynia was originally used in the belief that the disease was an infantile form of the Paris epidemic. With the latter it has no connection whatever, and, as liable to confuse, the name should be dropped.

Paterson and Greenfield's Erythroedema polyneuritis has found favour with a few, but it is cumbersome, and the pathology is not yet clear enough for the label polyneuritis to go unquestioned.

For the same reason the German term Vegetative Neurosis of Feer is not likely to find general favour throughout the world.

Swift's Disease, Feer's Disease, Selter-Swift-Feer Disease have all been put forward. If any name should be connected with the syndrome one feels /

feels Swift has indubitably the prior claim, but the practice of naming a disease after its first describer is open to criticism, as it conveys no clue to its nature, and invariably leads to a certain amount of quibbling.

There being certain objections to all suggestions, it is better to go on speaking of Pink Disease in this country than to have perpetual confusion with several names. Perhaps when we have a clearer idea of its nature another more accurate name will suggest itself.

Clinical Picture:

A description of ten cases personally studied recently will help to make this clear.

DESCRIPTION OF CASES. /

DESCRIPTION of CASES.

- I. ELLA B.⁽⁸⁾₍₁₇₎ - Admitted to hospital 13.4.31 because of irritability and sleeplessness for two weeks, together with loss of appetite and weight and "a burrowing of face into the pillow".

Family History:

Father 31)
Mother 26) Both healthy.

Live in four-roomed house with garden.

Patient is only child.

History - obtained from mother, who is an excellent witness and a very capable mother.

Born full term and healthy - 7 lbs. in weight.

Breast fed for three weeks - then on Ambrosia up till present time - Cod Liver Oil, one tea-spoonful daily since birth - orange juice daily since one month old - Virol for two weeks - rusks for one month.

Fuller's Earth powder and Robin Starch used daily.

Has not been in habit of sucking anything.

Baby was quite well till four weeks before admission, and had been taken weekly to a welfare clinic. The first symptom was a cough with nasal catarrh; she was taken to the family doctor who suggested it might be the onset of whooping cough.

A fortnight later she became gradually very restless and irritable, with a tendency to rub her feet and scratch them. She required constant nursing, while previous to this she had been a quiet contented child. These symptoms became progressively worse, and very little sleep was obtained.

History (Contd.):

A tendency to avoid the light by turning the eyes away was noticed, and, after being marked for a few days, became less in evidence.

The week before admission a rash appeared over the body, and the hands and feet were observed to be unusually red in colour. Sweating was marked.

The appetite was poor, and often she would not finish her bottle. Weight had been lost. The bowels were regular; there was no vomiting. Sleep was only obtained in her mother's arms or with the face buried in a pillow.

No history of fever at onset was elicited.

Condition on Admission:

A sturdy fair-haired baby, obviously well cared for by an observant mother. General condition fairly good - able to sit up and hold hand, but there is abnormal muscular flabbiness, and the skin covering the thighs is loose and wrinkled, as if there had been rapid recent loss of weight. This is most marked over the adductor region.

She is obviously irritable and miserable. From the restless movement of the hands and feet it seems she is attempting to find relief from some pain or irritation affecting them. One foot is rubbed against the other ankle; she cries piteously and has an expression of intense misery.

The general development is good. There is no sign of rickets. Weight, 16 lbs. 11 oz.

Skin: The cheeks are very red, as if she had been exposed to extremes of weather. The skin elsewhere is moist and covered with an erythematous rash, most marked on the back, chest, buttocks, vulvar region and the temples. The rash consists of tiny red spots with occasional pin point raised watery papules in the middle of a reddened /

Condition on Admission (Contd.):Skin (Contd.):

reddened area. It is most like a sweat rash.

The hands and feet are moist, cold, slightly swollen looking, and quite definitely of a reddish colour. This is most marked on the palms and soles and the fingers and toes which seem enlarged. Between the fingers and toes are watery papules. The redness does not extend as far as the wrist and ankle joints, and gradually shades off. No pitting on pressure.

There are scratch marks scattered over the body. The scratching and excoriation of the skin is very marked in the vulvar region which is swollen, inflamed and cracked. There is an ulcerated area on the inside of the thigh near the vulva.

Glands: Slightly enlarged in inguinal region - not elsewhere.

Mouth and Naso-pharynx: There is marked salivation with constant dribbling, but the mouth is fairly clean. The gums are healthy - no teeth as yet. On the right edge of the tongue is a little submucous haemorrhage, as if the tongue had been nipped between the gums.

There is a well marked thin mucoid nasal discharge.

The tonsils seem normal.

Heart: Not enlarged. Sounds closed. Rate uniformly fast - 150 (awake and at rest).

Lungs: Nil abnormal - no cough.

Abdomen: Nil abnormal - easy to palpate. Liver and spleen not palpable. No anal spasm. Stools normal.

C.N.S.: No squint or ptosis. Dislikes a strong light, but there is no marked photophobia. Knee and ankle jerks both present /

Condition on Admission (Contd.):C.N.S. (Contd.):

present and, if anything, exaggerated.

On testing with a pin there was no loss of cutaneous sensibility.

Muscles: General hypotonia and wasting, especially of adductors.

Blood: R.B.C. 5,200,000.
H.B. 74%.
W.B.C. 16,885.

Tuberculin reaction - Negative.

Urine: Contained a trace of albumen. No pus cells.

The impression given on admission was that of a case of Pink Disease in an early stage with no trophic lesions.

Progress Notes:

18.4.31. Seems more irritable - lies doubled up in knife rest position. Rash fading off trunk but redness of hands and feet more marked.

Condition of vulva improving.

Pulse rate never below 136 even when asleep; when awake up to 160.

Leucocyte counts done at this period showed a progressive leucocytosis, viz.-

15.4.31	-	16,885	per c.mm.
16.4.31	-	17,942	" " "
18.4.31	-	26,562	" " "
20.4.31	-	25,000	" " "
21.4.31	-	28,125	" " "
22.4.31	-	27,432	" " "
23.4.31	-	32,187	" " "

Differential Leucocyte counts showed a predominance of lymphocytes with a "shift to the left" in the granular cells - viz.-

Date /

Progress (Contd.):

Date of Count ..	14.4.31	15.4.31	17.4.31	22.4.31
Basophil	2.5	1	.5	0
Eosiniphil.. ..	0	1	1	.5
Myelocytes.. ..	4.5	4.5	.5	.5
Meta-myelocytes..	4.5	2	1	3
Band Forms.. ..	7.5	9	2	7.5
Polymorphs.. ..	9.5	18.5	11.5	25
Small Lymphocytes	64	58.5	63.5	46
Monocytes	7.5	5.5	20	17.5

23.4.31. Rash on body gone - scratch marks in places.

Hands and feet very typical of condition - have a peculiar sweaty smell.

Ulcers on buttocks suggesting trophic lesions.

Pin prick still felt - knee and ankle jerks very active.

Photophobia practically gone - running a temperature of 99° to 100° - losing weight slightly.

27.4.31. Seems a little brighter and plays with toys in a half-hearted fashion. Feet very red and sodden.

Small sore appeared very suddenly in submental region and quickly increased to the size of a sixpence - crusted over.

29.4.31. Rash has reappeared on hands and feet. More contented and plays with toys.

Sores have appeared on chin, right pinna and right cheek, and are increasing in size.

Condition of buttocks slightly improved, but skin round anus very excoriated.

1.5.31. Discharged home to report in fourteen days.

5.5.31. /

Progress (Contd.):

5.5.31. Re-admitted as she could not be managed at home.

Has a decided pinkness of both cheeks and tip of nose.

Rash on body has reappeared.

Hands and feet red and raw looking. There is desquamation of the skin in large patches, similar to that seen in scarlet fever, on the palms of the hands and, less marked, on the soles of the feet.

Sores on chin and right ear are drying up; another sore has appeared between 1st and 2nd toes of right foot. These sores usually commenced as superficial bullae.

Otherwise condition is much as before. There is no anorexia and food is taken well.

9.5.31. Heart is very rapid and was counted 180 per minute at the apex. Seems happier and is sleeping better.

Colour of hands and feet fading - marked desquamation.

Lies often in a crouching attitude with knees drawn up and face buried in bedclothes. No marked photophobia, but often frowns and screws up eyelids. K.J. very active.

16.5.31. Improving very much - marked desquamation of hands and feet with fading of colour.

K.J. very active. Pulse 168.

23.5.31. Now comparatively happy and contented - sleeping and taking food well.

Hands and feet still desquamating, but otherwise nearly normal.

Pulse is still 156. Temperature normal for first time.

29.5.31. /

Progress (Contd.):

29.5.31. Discharged home.

It is a curious fact that the improvement in this case seemed to date from the appearance of the skin sepsis.

Weight 16 lbs. 8 oz.

16.6.31. Seen as O.P. Seems perfectly well, happy and contented. Sleeps and eats well. Still some dry desquamation of soles of feet.

Pulse 128. Knee jerks active.

II. ERNEST T. (¹¹/₁₂) - Admitted to hospital 27.4.31 because of stomach trouble and "cutting teeth through gatherings" - ulcerated mouth.

Family History:

Father aged 31, working)
as miner.) Both healthy.
Mother aged 27.)

One other child, aged six years, never been ill.

History - obtained from mother, who seems very capable.

Baby born 11.5.30, weighing 7 lbs. 12 oz., after an easy confinement. Got on splendidly till the age of six months when he had two teeth.

Was breast fed till a fortnight ago - also had cow's milk steamed, Nutrix, rusks, oat flour and Cod Liver Oil.

The first thing to attract attention was the appearance of ulcers on the gums, tongue and the sides of the mouth. About the same time a rash "like little red spots" appeared, and was most marked on the legs and arms, especially the backs of hands. The rash lasted fourteen days, and during that time a marked dislike to bright light was shown. Then the mother noticed the hands and feet were becoming a peculiar dark red colour.

Sleeplessness was a very marked symptom and the one which naturally impressed itself most on the mother who says he never slept for four months.

There was no trouble generally with the bowels, but on Christmas Eve (about a month from the start of the illness) baby had an attack of vomiting, followed by the passage of a considerable quantity of dark coloured blood per rectum.

Baby has had nasal catarrh and cough for some time. Since taking ill the change from a happy contented nature to the present state /

History (Contd.):

state of misery has been extreme.

Irritability has always been a marked feature. The hands and feet especially were always being rubbed. In the early stages he used to rub his eyes with his fists and shield them from the light.

Condition on Admission:

General condition of child is fairly good considering the length of the illness. On the whole he is very miserable and irritable, but occasionally he will smile in a wan fashion and will play with toys.

He can sit up in a chair. Every few moments an expression of misery comes over his face, and he hangs his head down, hiding it. He rubs his hands and feet together, as if they were the seat of disagreeable sensations. He does not scratch his body to any extent. 17 lbs. 5 oz. in weight.

Skin: The cheeks are red and exposed looking. There is some desquamation of the cheeks and the tip of the nose.

The skin generally is dry and the usual sweating is absent. There is no rash. Round the scrotum penis and on the inside of the thighs there is some superficial ulceration.

The hands and feet are swollen, rather clammy and pinkish in colour. There are a few reddish papules raised from the pink area. The fingers appear broadened from side to side.

Glands: None palpable.

Mouth and Pharynx: The tongue, gums and mucosa of the cheeks are dotted with small ulcers. The gums are red and swollen.

Has eight teeth which are dirty and covered with sordes.

There is a thin muco purulent nasal discharge.

Tonsils /

Condition on Admission (Contd.):Mouth and Pharynx (Contd.):

Tonsils seem normal.

Salivation is marked.

Eyes: There is distinct lacrimation and photophobia which appears to vary from time to time.

Heart: Normal in size - no murmurs - rate rapid, 146 per minute.

Lungs: No abnormal signs - cough present.

C.N.S.: Cranial nerves normal. Knee and ankle jerks brisk. There seems to be some lowering of sensibility to pin pricks.

Abdomen: Nil abnormal. Spleen and liver not palpable.

Muscles: Very marked hypotonia. Extreme wasting in adductor region - skin very wrinkled here.

Temperature round 100°.

Hypotonia and misery are the most marked features.

Progress Notes:

<u>1.5.31.</u>	R.B.C.	5,049,000.
	H.B.	55%.
	W.B.C.	20,625.

Differential Leucocyte count:

Basophils	..	.5
Eosiniphils	..	.5
Myelocytes	..	.5
Meta-myelocytes		4
Band forms	..	5.5
Polymorphs	..	18.5
Lymphocytes	..	38
Monocytes	..	32.5

Baby appears very miserable. Is crawling about bed with a whining cry.

2.5.31. /

Progress (Contd.):

2.5.31. Marked discharge seen in nasopharynx.

Temperature rose to 102.6° at 6 p.m.

3.5.31. High temperature - very ill, with temperature at 6 p.m. 103.6°.

No physical signs in chest. Is very quiet and drowsy.

4.5.31.

11 a.m. Collapsed - lying very quiet with extremities blue and cold, and pulse at wrist almost imperceptible.

There is a peculiar redness of cheeks, nose and chin. Skin is very dry.

Moist rales heard at both bases.

Vomited an hour ago - mucus, undigested food and pus which is coming from nasopharynx.

3 p.m. Child very quiet and conscious. No acute respiratory distress, though rate is 56. No twitching. High colour of cheeks persists. Temperature 105.4°.

Quietness of last two or three days is ominous.

10.45 p.m. Died. Child had lain in same condition all day. Death was sudden - seen fifteen minutes before, when there was nothing to suggest imminence of death.

Post Mortem:

Slight early broncho-pneumonia in both lungs. Otherwise no gross naked-eye changes.

The brain and spinal cord were taken for detailed examination by Dr. A. F. Bernard Shaw.

III. JAMES A. (⁷/₁₂) - Seen in private 30.4.31. The mother complained that the baby had been troubled with (a) Inflammation of eyes - three months ago, (b) Ulceration of mouth, (c) Sleeplessness and irritability, and, of late, wasting and loss of appetite.

Family History:

Father and mother both in good health.

One child aged four - girl - very well.

History:

Full term child weighing 9 lbs. Thrived well and appeared a picture of perfect health till four months old.

The onset appeared distinctive - mother gives the exact date thirteen weeks previously - with sudden misery and painful irritation of eyes, causing the baby to hang his head. On previous day he had been perfectly well.

Exactly a week before he had similar symptoms lasting twenty-four hours - suggesting an aborted onset of the condition.

Within a few days baby became very irritable and the soreness of eyes and photophobia continued. This went on for six weeks with constant misery and insomnia, but still taking the breast well. Sweating was very marked during this time, but there was no redness of the extremities or skin irritation.

Then ulceration of the mouth was noted. After seven weeks' illness irritability of the hands and feet was noticed, and a diffuse miliary rash appeared on the body. There it lasted a week, but was more prolonged on the hands and feet which lately have peeled slightly.

Bowels regular throughout - no vomiting.

Was entirely breast fed before onset - has never sucked sweets or dummies - starch and borax dusting powder used.

Has /

History (Contd.):

Has been taken off breast during the last week, and is now getting cow's milk, cereals, soup and gravy. Mother thinks baby is taking food a little better.

Mother says baby has never smiled once since onset. She took baby to the Eye Infirmary a week ago, thinking there was something wrong with his eyes.

Condition on Examination:

Attitude very typical of Pink Disease - lying limply in mother's arms with head hanging and face buried in breast. There is evident photophobia and profuse lacerimation.

There is very marked wasting, weakness and hypotonia of muscles. Expression of extreme misery on face and resentment of any touch or attempt at examination. There is no wriggling or scratching, and there does not appear to be much irritation.

Weight 14 lbs. - loss of weight appears to have been rapid of late.

Skin: Rather dry. Has a rash over trunk and legs. This has appeared three or four times during illness and consists of red miliary papules.

The hands and feet are moist and bright pink in colour. They were of a purplish colour till recently, according to the mother. They are swollen, but there is no pitting on pressure. A few sweat pimples are scattered over them. There are no scratch marks, nor is there any skin ulceration.

Face is pale - cheeks and nose have never been red.

Glands: Slightly enlarged in groin.

Mouth and Pharynx: Gums look swollen - no ulceration anywhere. Has two upper eye teeth and two lower central incisors. Marked salivation. Watery nasal discharge. Nothing to note about tonsils.

Heart: /

Condition on Examination (Contd.):

Heart: Not enlarged - sounds closed -
very rapid - 170 per minute while lying
at rest awake.

Lungs: Nil abnormal.

Abdomen: Nil abnormal - very easy to palpate.
Liver and spleen not enlarged. No anal
spasm.

C.N.S. Knee jerks very active. Cranial
nerves normal. No loss of sensation.

Blood: Film shows predominance of
lymphocytes.

W.B.C. 18,400.

Impression given of a typical Pink
Disease with great wasting, weakness and
hypotonia and unusually marked photophobia.

Progress Notes:

31.5.31. Improving slowly. Sleeps without
any hypnotic and takes his food fairly well.

Mouth clean - has cut other two teeth
and gums are swollen. Salivation prominent

Has still marked photophobia and his
favourite attitude is to stand on his
mother's arm and bury his face on her
shoulder. The eyelids are swollen and
there is lacrimation.

The rash has practically gone - a few
scattered papules.

Hands and feet have faded, swelling
has gone and they are almost normal. Feet
have a brownish tinge on the soles.

Cervical and inguinal glands palpable.

Heart still very rapid - 156 per
minute.

There is still marked wasting and
great hypotonia - marked misery - cried
incessantly during examination. Does not
sweat much now.

Knee /

Progress (Contd.):

Knee jerks elicited as very brisk after great delay in being able to obtain them.

8.7.31. Practically recovered - happy and contented - sleeps and eats well - no photophobia.

Filling out, and muscular condition now very fair - is still thin but has grown tall. Has now eight teeth.

Mother says he is inclined to respiratory catarrh.

Pulse is still very rapid - 152.

Knee jerks present.

Now tries to stand and crawl about.

IV. MARGUERITE O. ($\frac{8}{12}$) - Seen in private 24.5.31.

Family History:

Father and mother both healthy - father commercial traveller - home circumstances good.

Three other children aged eight, six and five respectively - all healthy.

History: - obtained in great detail from mother who is extraordinarily observant and very capable.

Weighed $9\frac{1}{4}$ lbs. at birth; wholly breast fed for seven weeks and partially for three months - then put on Sister Laura's Food, which seemed to cause pain. Doctor consulted, who advised milk and water.

Robinson's Patent Barley from $3\frac{1}{2}$ months.

This baby has never slept so well as the other children did.

When six months old she was noticed to be always rubbing her head on the pillow and rubbing her face and ears. A few days later she cut a tooth. Then she became restless again and cut a second lower incisor. Mother noticed she was getting thinner, and a few spots came out at intervals on hands and body (chiefly on arms). These rashes were very transient.

About the end of April - a month before examination - baby developed a "dreadful cold", with eyes and nose running profusely, and she started perspiring in an extreme fashion, chiefly about the head.

A rash was noticed on her back, and the hands and feet were unusually red. About this time baby seemed unable to hold up her head, and the legs became very wasted. A disinclination for the light was evident and baby started to bury her face.

Insomnia had always been a prominent symptom.

Has /

History (Contd.):

Has had the rash on body for a month now - comes and goes. The feet have always been cold - the hands less so.

The face was pale till two days ago.

There was a lot of skin irritation and ulceration round the buttocks - it was because of this that doctor was first consulted.

Mother gives a history of a remarkable series of attacks of melaena.

The first occurred on April 25th at 4 a.m. Baby was lying in bed when she cried and shortly afterwards passed dark blood per anum.

The next day at 8 p.m. this was repeated.

The succeeding day at noon she had a profuse bleeding. The blood was always mixed with faeces.

On May 11th at 4.30 a.m. she again passed blood after crying. This was repeated during the night on May 16th.

Mother noticed that on each occasion after the passage of blood the rash seemed to come up more vividly about the back and buttocks.

Present weight (stationary for three weeks now) 16 lbs. At six months weighed 18 lbs.

Condition on Examination:

Baby lies on mother's knee, scratching at intervals, and often cries piteously. Usually keeps eyes shut but photophobia is only slight. A common habit is to pull at her hair, but none has come out. Lies with mouth open - probably due to nasal snuffles.

Skin: Face is red and flushed - cheeks very red - tip of nose polished and shiny - there is a faint rash on forehead.

Rash /

Condition on Examination (Contd.):Skin (Contd.):

Rash all over body and most marked on back. Consists of little red papules, occasionally raised and shiny in the centre. Papules are almost confluent in places on back. Rash has appeared on cheeks and necks in last three days.

There is a dull red area over buttocks - here there was ulceration previously. Vulva is red, swollen and cracked.

On the left knee are two sores - one lateral to patella and one over head of fibula. These appeared as reddish spots after the last attack of melaena. They then spread, crusted, and are now drying up.

Feet are very typical - swollen, shiny, cold and bluish red in colour, especially on the soles and toes. The colour extends up to just below the line of the ankle joint where the rash meets it. There is no pitting on pressure.

Hands not affected to the same degree, except the tips of the fingers. The rest of the hand is covered with the papular rash.

Glands: Enlarged in neck and groin. One palpable below left nipple.

Mouth and Naso-pharynx: Mouth clean - two teeth firm in gums.

Marked nasal catarrh which is purulent.

Heart: Very rapid - 160 per minute. Not enlarged - no murmurs.

Lungs: A few scattered rhonchi in both lungs.

Abdomen: Curiously distended and difficult to palpate. Liver and spleen are both palpable. Baby seems troubled with wind.

C.N.S.: Cranial nerves normal.
Knee jerks present.
No anaesthesia.

Urine: /

Condition on Examination (Contd.):Urine: Trace of albuminurea.Blood: W.B.C. 19,800.Differential Leucocyte Count:

Myelocytes	..	2
Meta-myelocytes		2
Band forms	..	6
Polymorphs	..	39
Lymphocytes	..	47
Monocytes	..	4

Impression: Pink Disease in fairly early stage with very vivid rash. The feet are typical; the hands not yet so. Mother thinks child is improving, and she does not whine so much. Sleeps a little better - is having three grains of luminal at night.

Most interesting is the melaena on five distinct occasions - history given is excellent and cannot be doubted. No purpuric spots afterwards.

Abdomen to-day is distinctly distended and unlike the usual flaccidity.

Hypotonia is very marked.

Progress Notes:

9.6.31. Very much better - smiles a little and sleeps fairly well. Still a little miserable and shows slight photophobia. Takes food well.

Rash gone - a few scratch marks about buttocks - not much irritation now.

Feet still reddish about toes and soles - show a fine desquamation.

Hands practically normal.

Mouth clean - still nasal catarrh present.

Abdomen flaccid. Still another attack of melaena on 4.6.31.

Hypotonia /

Progress (Contd.):

Hypotonia still marked. Pulse 168.

Knee jerks + +.

16.6.31. Improving. Still wasted and pulse still rapid - 150. Knee jerks present.

Sleeps well and eats well.

V. JOHN B. ($\frac{11}{12}$) - Admitted to hospital 27.5.31.

Family History:

Father healthy. Mother has been suffering from anaemia for some time. She had kidney trouble during pregnancy and was confined to bed for $4\frac{1}{2}$ months before her confinement, which was easy.

Has one other child which is healthy.

History:

This baby was breast fed till just before admission - supplemented with Nestle's Milk at times. Ostelin given for four months before admission - also soup and orange juice.

At the age of four months he began to get flabby and restless at night. Then a rash came out on the back and legs. Some of the spots became "festered". The rash disappeared and reappeared again several times.

When six months old mouth was noticed to be ulcerated. This was better before teeth were cut.

A week or two after this hands and feet became swollen, cold and bluish red in colour. Mother thought they were chilblains.

Baby became whining and irritable, and has never smiled at all for months. He used to lie and scratch himself a lot, and preferred to lie in the dark.

Sweating was very profuse. His pillow got wet and his vests had to be changed twice daily.

Mother cannot remember any naso-pharyngeal catarrh at onset, but baby had bronchitis once or twice during illness and used to cough up "green phlegm".

Baby became very thin and muscles got wasted. He used to lie in bed "all curled up".

For /

History (Contd.):

For a long time feeds were taken fairly well, but for six weeks before admission there was some anorexia.

Bowels tended to be very constipated throughout. There was also some trouble in passing water, and a fortnight before admission baby was circumcised.

Mother noticed baby's cheeks and nose were always red.

Condition on Admission:

Considering the duration of symptoms baby is in wonderfully good condition - looks fairly well nourished. Is rather irritable and looks very miserable for a time; then suddenly appears to brighten up and very occasionally will play with toys.

He spends most of the time lying in bed face downwards with his head at the foot of the bed, and saliva dribbles from his mouth. Then he tries to sit up, but soon topples over and lies in the knife rest position.

At intervals a pained expression comes over his face and a whining cry follows.

There does not appear to be any photophobia but face is almost invariably buried in the bedclothes. There is a slight purulent conjunctivitis of the right eye.

Temperature 99°. Weight 17 lbs.
9 oz.

Skin: Face has a weather beaten appearance. The cheeks are reddish brown in colour. The tip of the nose is shiny and there is slight desquamation. There are a few spots on the chin.

The hair is dry and scraggy.
Fontanelle is nearly closed.

There is a generalised rash most marked /

Condition on Admission (Contd.):Skin (Contd.):

marked over back and left side of chest and abdomen. It consists of reddish brown papules with here and there a papule with a watery centre - resembles a sweat rash. The rash extends over both arms and legs.

There are a few areas on legs with darkish discoloration which seem to have been the site of pustular lesions.

The hands are very typical, swollen without pitting, cold and reddish pink in colour. There are a few papules on the backs of the hands.

The soles of the feet and toes show the same characteristics. There are papules on the dorsum of the feet.

Glans penis is still raw after the phimosis.

Glands: Those in inguinal region are palpable.

Mouth and Pharynx: Mouth is clean - nine teeth present firmly fixed in gums. Thin discharge from anterior nares. Tonsils normal. Salivation excessive.

Heart: Rapid, 144 per minute - not enlarged. No murmurs.

Lungs: Have a few coarse scattered rhonchi all over.

Abdomen: Flaccid. Spleen not palpable, but liver is just palpable. Nil abnormal.

C.N.S. It is very difficult to test knee jerks, as baby is continually moving his legs and rubbing the one with the other foot. He resents any attempt at examination. No obvious anaesthesia. No squint or ptosis. Knee jerks present after long struggle to elicit them.

Has a trace of albuminurea, sleeps indifferently, sweats intermittently, but takes food fairly well.

Tuberculin /

Condition on Admission (Contd.):

Tuberculin reaction negative.

Blood: W.B.C. 15,400.

Differential Leucocyte Count:

Basophils	..	1.5
Eosinophil	..	2
Myelocytes	..	.5
Meta-myelocytes		.5
Band forms	..	1.5
Polymorphs	..	33.5
Lymphocytes	..	50
Monocytes	..	10.5

Impression:

Typical Pink Disease at present covered with miliarial rash.

Fairly well nourished and face looks quite plump, but there is marked hypotonia and wasting of muscles, especially in the thighs.

Attitude in bed very typical, and skin irritation is evident.

Progress Notes:

8.6.31. Seems much better - sits up and smiles occasionally. Sweats a lot - slight rash on trunk - rather larger papules on arms.

Hands are to-day a cyanotic colour which is blanched on pressure. Feet, on the other hand, are a bright pink. The swollen fingers have a spatulate appearance.

No photophobia - irritation is less. Is rather snuffly about the nose.

Heart still very rapid - 160 per minute.

11.6.31. Discharged home to report in three weeks, seemingly improved.

15.6.31. /

Progress (Contd.):

15.6.31. Report from doctor to say he had died of broncho pneumonia that day after two days' illness following measles.

This was probably a recrudescence of the rash. No cases of measles have occurred in the hospital.

No Post Mortem obtained.

This death was totally unexpected, as he seemed much better on the 11th. He always had shown a tendency to bronchitis.

During the stay in hospital weight remained stationary, and the temperature was usually between 98° and 99° - only once above 99°.

VI. LAWRENCE A. ($\frac{10}{12}$) - Admitted to hospital 5.6.31.

Family History:

Parents healthy - father's occupation gardener at big house - healthy home.

One other child - girl of four years - healthy.

History:

Born weighing $9\frac{3}{4}$ lbs. after easy confinement. Was breast fed only a few days and then put on Nestle's Milk. Later this was changed to cow's milk mixture, and recently had been having rusks, eggs, potatoes, fats, bread and butter.

Four weeks before admission mother noticed baby would not play as before and cried a lot, seeming unhappy. He has only smiled very occasionally since then. He very often scratched his face and abdomen, and rubbed his nose on the pillow. He did not like a strong light and kept his eyes half shut.

Sleep became disturbed and he began to lie face downwards as a rule.

Condition on Admission:

Baby is well nourished - rather pallid in appearance - weight 23 lbs. 5 oz. He is very fretful, looks miserable, and mostly is crying. He wriggles about a lot and buries his face in the bedclothes.

He keeps his eyes half shut, and always lies face downwards. There is distinct photophobia. Sweating is very profuse.

Baby will sit up in bed for a few seconds, then lies down curled up like a young kitten. Still takes interest in surroundings and can be made to smile; then suddenly becomes miserable again and starts to whimper.

Skin: Hair plentiful - cheeks fresh coloured /

Condition on Admission (Contd.):Skin (Contd.):

coloured and rather rosy but not the colour typical of the disease. The skin all over is very moist and damp. There is a peculiar odour, called "mousy" by some people, noticeable.

There is a slight miliarial sweat rash, most marked on the back. There are a few spots on the chest and abdomen, also on the wrists and arms.

Irritability does not seem very intense, but there are scratch marks on lower abdomen.

Hands and feet are very cold, moist and clammy. The finger tips are pink in colour - the remainder of the hands and the feet are normal. No rash on them.

Glands: Normal.

Mouth and Pharynx: Clean. Two teeth present, firmly fixed in gums.

Heart: No enlargement - no murmurs - rate rapid, 158 per minute.

Lungs: Nil abnormal.

Abdomen: Nil abnormal. Spleen and liver not palpable.

C.N.S.: Nil abnormal. No squint, no ptosis, no anaesthesia. Knee jerks active. No ankle clonus.

Muscles are flabby, but this is not marked. There is no great hypotonia or wasting as yet.

Temperature: 100° F.

Impression:

Early case of Pink Disease with restlessness and misery and photophobia. Rash hardly developed - hands and feet practically normal in colour.

Progress Notes: /

Progress Notes:

11.6.31. Has now a generalised rash all over body. Consists of tiny punctate papules rather like rash of scarlet fever, mingled with a few pin point vesicles. The rash is very profuse and covers whole body.

The hands are becoming very typical - bright pink in colour, very cold and swollen. The feet are cold and swollen but colour is still normal. There is no pitting on pressure.

Sweating is very profuse and there is a distinctive odour.

Baby is now much more miserable, and cries and whines continuously. Is very restless. Can pull himself up by hanging on to side of his cot, but he soon topples over and lies in bed like a partially closed pocket-knife.

Eyes are very watery - evident photophobia. Pulse 164.

W.B.C. 8,800.

Differential Leucocyte Count:

Eosiniphils	..	.5
Myelocytes	..	.5
Band forms	..	2.5
Polymorphs	..	20
Lymphocytes	..	59.5
Monocytes	..	17

15.6.31. Rash on body fading - spots to-day rather purplish in hue and mostly on arms and legs.

Hands are dusky red, swollen and cold - miliaria on dorsum.

Feet are normal in colour.

Sweats very profusely - very miserable and sleeps badly. Scratches till skin bleeds.

Photophobia still present.

Has /

Progress (Contd.):

Has cut four upper teeth.

Pulse 158. Knee jerks very active.

Temperature 99°. Weight down to
22 lbs. 5 oz.

Trace of albumen in urine.

17.6.31. Discharged home to report in
fourteen days.

24.6.31. Died suddenly after twenty-four
hours' diarrhoea.

Sudden unexpected death.

VII DOREEN H. (1²/₁₂) - Admitted to hospital 10.6.31.

Family History:

Parents healthy - live in three-roomed house in healthy district near the river.

Two other children, a girl aged seven and a boy aged five.

History:

Full term baby - natural labour - not weighed. Breast fed for ten months; since then cow's milk, eggs, milk puddings, fruit, fish, gravy, fats e.g. "bacon dip" etc., vegetables.

Baby cut first tooth and sat up at six months - walked at ten months.

Has never been ill till onset of present trouble.

Four weeks before admission mother thought baby was getting fretful and she was always wanting to be nursed. About the same time she noticed a rash on the backs of her hands and between the fingers. Desquamation then occurred on the fingers, and baby used to pick at the skin.

Since then parents have had no sleep, as baby has cried and twisted all night and has been very miserable and irritable. She has not smiled for three weeks.

A fortnight after onset the feet were similarly affected. Baby used to be continually rubbing her hands and feet.

Baby used to keep her face buried, but did not seem afraid of the light.

A generalised rash appeared four days before admission. Sweating was very marked.

Condition on Admission:

Baby looks fairly well nourished.
Weight 18 lbs. 5 oz.

She /

Condition on Admission (Contd.):

She is very fretful and miserable, wriggles about when handled, and appears distressed.

She is able to sit up on a chair and can stand on her feet, but is frightened to walk, and holds out her hands for support.

Skin: Scalp is very seborrheic and looks as if some hair had been lost recently. Baby is continually pulling at her hair.

Cheeks are very red and scaly.

There is a rash over whole body, tiny red spots resembling a sweat rash. In parts a fine desquamation is commencing.

The hands are very typical - red, raw and glazed looking, swollen and cold. There is desquamation of the palms and fingers.

The feet are similarly affected but in a lesser degree. The soles are desquamating. There are tiny red papules on the dorsum. No pitting of either hands or feet.

Mouth: Clean - eight teeth firm in gums. Throat normal.

Eyes and Ears: Normal. No photophobia.

Heart: Nil abnormal except rate which is 136 per minute.

Lungs: Normal.

Abdomen: Nil abnormal. Liver and spleen not palpable.

C.N.S.: No paresis. No anaesthesia - cranial nerves normal. Knee jerks present.

Muscles: Flabby, but not a great deal of wasting. Skin wrinkled in adductor region.

Sweating a lot - takes food well - sleep fair.

Temperature runs between 98° and 99°.

Tuberculin reaction negative.

Impression: /

Impression:

Mild case, but hands and feet and general misery are very typical.

Progress Notes:

18.6.31. Profuse desquamation of hands and feet - fine powdery desquamation of body.

Pulse rate 144.

Has some conjunctivitis.

Knee jerks absent.

19.6.31. Right knee jerk absent; on left side present occasionally. On repeating the tap it is lost - exhaustion of reflex. After waiting a few minutes it can again be elicited.

21.6.31. Both knee jerks absent.

Blood W.B.C. 8,400.

Differential leucocyte count:

Meta-myelocytes	..	4.5
Band forms	20
Polymorphs	33.5
Lymphocytes	37.5
Monocytes	4.5

Though the reflexes are absent she is very sensitive to pin pricks and resents this intensely.

23.6.31. Has been seen to smile and seems to be improving in her general condition, though she is still losing weight - now only 17 lbs.

Rash has gone - hands and feet show typical marked desquamation.

The knee jerks are still both absent. She cannot now stand on her feet - simply collapses on floor.

28.6.31. Knee jerk present on left side, but very slight response. Cannot stand - there is now marked muscular atrophy of legs.

Despite /

Progress (Contd.):

Despite the neuro-muscular trouble of the last ten days, her general behaviour and condition is improving considerably. She eats and sleeps well, and the colour of the extremities is fading. They show marked desquamation, while the cheeks are also peeling. They have a weather beaten appearance. She is still miserable to some degree, and has naso-pharyngeal catarrh.

The course of the disease is not running parallel with the condition of her legs.

30.6.31. Knee jerk quite brisk on left side; absent on right. Stood up in her bath this morning.

The pulse is very fast - 156. Still losing a little weight - much happier.

2.7.31. Can now stand. Desquamation nearly complete. Knee jerk present on left side; absent on right. Has a cough. No signs in chest.

4.7.31. Both knee jerks present.

Discharged home.

13.7.31. Much improved. Sleeps all night and eats fairly well. Desquamation complete. Still inclined to rub one leg against the other.

Pulse 144.

Knee jerks both quite brisk - will not stand by herself yet.

27.7.31. Nearly recovered - has been walking for a week - not very steady yet on her feet - walks on a wide base.

Desquamation complete - still has redness of cheeks - some nasal catarrh.

Pulse still rapid - 140 per minute.

Knee jerks both present.

Mother /

Progress (Contd.):

Mother says she occasionally has attacks of screaming when she is very irritable and will strike at anyone near by. She sweats in those attacks. They usually end in sleep from which she wakes in a better temper.

Has had no more rashes of any description.

She has put on a lot of weight, and looks now a fairly normal baby of her age.

VII. DOROTHY P. ($\frac{8}{12}$) - Admitted to hospital 15.6.31.

Family History:

Parents healthy. Good home.

Five other children, all healthy - four girls aged sixteen, thirteen, twelve and ten respectively, and a boy aged two.

History:

Full time child - normal labour - not weighed at birth - breast fed all the time.

Three months before admission mother noticed baby was becoming irritable and was sleeping badly. Since then baby has never smiled.

Next a loss of weight and a reluctance to take her feeds became evident.

A month after the onset of these symptoms a rash appeared on the body, and baby began to scratch and rub her hands and feet which began to take on a pink colour. Baby always lay burying her face in the pillow, but did not object to bright lights.

Condition on Admission:

Baby is very miserable, fretful, irritable and restless, and looks ill. She lies in bed whining and crying and chewing her hands. It is quite impossible to get even the vestige of a smile from her. She takes her feeds fairly well, drinks quite greedily, and sleeps on the whole quite a lot.

Weight, 11 lbs.

Skin: Hair is thin and scanty. The cheeks and the tip of the nose are red, contrasting vividly with the pallor of the rest of the face.

The eyes are a little sticky with discharge, but there is no photophobia. Despite this, baby constantly rubs her face on the pillow.

There /

Condition on Admission: (Contd.):Skin (Contd.):

There is a fading bruise on the forehead at the root of the hair towards the right side. Other bruises are seen over the sacral region. Baby would appear to toss herself against the sides of her cot to cause these.

There is a rash scattered over the body - tiny red spots like sudamina over whole back, extending up to neck, chest, arms and legs and the dorsum of the hands and feet. The skin generally is moist and damp, sweating being profuse.

The hands and feet are pinkish red, swollen and damp, but not markedly cold.

The palms of the hands and the distal phalanges are typically raw and glazed looking. On the dorsum of the hand and on the fingers are tiny reddish papules which stand out from the surface.

The feet are not quite so much affected, but the soles and the toes are red, swollen and shiny. There is no pitting on pressure. The rash occurs on the dorsum.

Glands: Cervical glands small and occipital glands also enlarged.

Mouth and Pharynx: Mouth clean. Six teeth firmly fixed in gums. Has some degree of naso-pharyngeal catarrh and coughs a lot. Tonsils normal.

Heart: Apex in normal position - sounds closed. Very rapid - 166 per minute.

Lungs: Rather poor thin chest with indifferent expansion. Percussion everywhere resonant. Breath sounds normal. No accompaniments.

Abdomen: Very flaccid. Nil abnormal. Liver and spleen palpable.

C.N.S.: Nil abnormal. No squint. No apparent anaesthesia. Knee jerks active.

Muscles: /

Condition on Admission (Contd.):

Muscles: Very wasted, with extreme atrophy of adductors of thigh. Over these the skin is almost rugose, reminiscent of the skin of the scrotum.

Tuberculin reaction negative.

Trace of albumen in urine.

Impression:

Severe case of Pink Disease - child appears to be resisting the malady indifferently.

Progress Notes:

18.6.31. Very miserable, damp and cold. Cries incessantly. Another bruise over tibia. Had to be protected from sides of cot.

21.6.31. Seems a little better. No sweating - rash fading - sleeps more and actually fell asleep when being pricked to get blood for examination. She did not appear to feel the stimulus of the needle prick. Blood appears very viscid - clots almost at once - very difficult to get enough blood for a leucocyte count. These babies will assuredly not die of haemorrhage.

23.6.31. Has been seen by nurse to smile twice. Seems quieter. Rash is fading. Seems to have considerable irritation of her legs - rubs one against the other. Keeps quieter when she has little booties on.

Skin is moist to-day.

Pulse 152. Knee jerks active, peculiarly so (as if there were some pyramidal tract lesion).

W.B.C. 17,800.

Differential /

Progress (Contd.):Differential leucocyte count:

Basophils	..	.5
Myelocytes	..	.5
Meta-myelocytes		2.5
Band forms	..	12.5
Polymorphs	..	27
Lymphocytes	..	48
Monocytes	..	9

25.6.31. Rash has again appeared on chest. Colour of feet is fading. Hands are desquamating, and wet sodden blisters are seen between the fingers.

There is also a raw ulcerated area on left thumb which has appeared suddenly.

28.6.31. Has become distinctly worse. Temperature has gone up to 102°. There are septic ulcers on both hands, especially between the fingers, and almost symmetrical in both hands. They start as septic spots and spread rapidly with destruction of tissue.

The rash has come out vividly again over the chest - rather darker in colour this time. Yesterday (27th) was noticed to have photophobia for the first time.

Passed a little blood per rectum this morning.

Knee jerks very active.

Lying in a condition of quiet misery.

30.6.31. Coughing a lot - rhonchi present over right base.

Pulse 164. Temperature coming down.

2.7.31. Baby very ill - lying very quietly with feeble squirming movements of hands and feet. This quietness is ominous.

Temperature going up again - reached 104° this afternoon. Pulse 170.

Marked sepsis of both hands.

Feet /

Progress (Contd.):

Feet are nearly normal. Rash has faded.

Knee jerks elicited with difficulty.

W.B.C. 19,000 - blood hard to obtain.

3.7.31. Very ill indeed. Hands a little better but sores have developed in mouth.

Temperature 106.2° at 6 p.m. Pulse 176.

Some rhonchi in chest - slight cough.

Knee jerks obtained with difficulty.

Septicaemia(?).

4.7.31. Died 11.45 a.m. of Septicaemia.

No Post Mortem obtained.

In this case one regarded the sudden quietness of the baby as very ominous.

IX. WILLIAM T. ($1\frac{1}{12}$) - Admitted to hospital 19.6.31.

Family History:

Father has asthma - Mother fairly healthy.

Has a brother aged fourteen, healthy, and two sisters aged twelve and ten who are both well.

A baby boy, aged nine months, died in 1925 of what was said to be "a foreign disease". During this illness he was acutely miserable, sweated profusely, was flabby and lost weight. No rash or any abnormality of extremities. No photophobia. Two teeth fell out during illness.

On reference to the doctor who attended this baby, confirmation was given that death was due to Pink Disease.

History:

Full term child - instrumental delivery. Weight not known.

Breast fed for ten months - then Ostermilk and good mixed diet.

Was well till $3\frac{1}{2}$ months old. Then mother noticed baby was becoming very cross and was losing weight. He was troubled with a cough and had bronchitis.

When five months old he showed a dislike of the light, and began to sleep badly and always with his face buried in the pillow. He was very restless and sweated profusely. He made no attempt to sit up, and has never tried to get on to his feet.

His appetite was very indifferent all the time till a month before admission, since when it has improved a little.

Mother, who gives a very clear account of this prolonged illness, is quite positive that baby has never had a rash of any description. Nor has he had anything to attract her notice about his hands or feet. He never rubbed his feet or hands, but used to /

History (Contd.):

to scratch his legs, especially over the shin bones.

Baby was acutely miserable all the time, and has not smiled for months.

He cut his first tooth at eleven months and now has four teeth. He has never had any ulceration in his month.

Condition on Admission:

Baby is well nourished and colour is good. Weight 19 lbs.

Without exception the most miserable baby one has ever seen - cries and wails incessantly. He lies curled up with his face buried in the pillow. His eyes water profusely, and his mouth is constantly dribbling saliva. Owing to weakness of the jaw muscles, the mouth is always open, and seems unusually wide transversely, while the lower jaw hangs down limply.

Photophobia is very marked. The corneae were tested with fluorescein but this revealed no naked eye breach of the surface epithelium.

He appears to have some irritation for he lies and scratches himself, especially in the genital region and round the tendons of Achilles.

Any touch or attempt at examination is actively resented.

Skin: No rash. Hands and feet quite normal. Skin is very moist, damp and clammy, and rather cold. Perspiration is very profuse, especially about the head.

Glands: Nil abnormal.

Mouth: Clean - four teeth.

Heart: No enlargement. No murmurs.
Very rapid - 164 per minute.

Lungs: Nil abnormal.

Abdomen: /



Condition on Admission (Contd.)

Abdomen: Nil abnormal.

C.N.S.: Nil abnormal. Knee jerks present.
No paresis or anaesthesia.

Muscles: Very marked hypotonia - soft and flabby everywhere. Wrinkled skin evidence of recent wasting.

Impression:

This is an undoubted case with no skin symptoms. The photophobia, hypotonia and the appalling misery are enough to establish the diagnosis.

Progress Notes:

23.6.31. Still very miserable and shows no real change. Lies in bed and chews his hands.

W.B.C. 15,333.

30.6.31. No change.

2.7.31. Running a temperature - up to 101.6° to-night.

Coughing a little - otherwise the same.

Skin normal. Not sweating so much.

Has lost 1 lb. since admission.

6.7.31. Differential Leucocyte Count:

Basophils	..	.5
Myelocytes	..	2
Meta-myelocytes		8
Band forms	..	10
Polymorphs	..	29
Lymphocytes	..	39.5
Monocytes	..	11

Trace of albuminurea present.

Slight temperature - usually 99°-100° all the time in hospital.

9.7.31. /

Progress (Contd.):

9.7.31. Discharged home to report in fourteen days.

Did not turn up owing to an attack of diarrhoea and vomiting.

9.8.31. Shows a wonderful improvement, and is now a comparatively happy child. His mother says he only cries now when the doctor comes.

Sleeps well and takes his food - has filled out a lot and muscular tone is now very fair. Weight 23 lbs.

He tries to walk a step or two when held up.

Has seven teeth.

Still has some nasal catarrh, slight photophobia and sweats a lot. Pulse 130.

X. MARGARET O. ($\frac{11}{12}$) - Admitted to hospital 23.7.31.

Family History:

Parents healthy - good home.

Two other children - boy aged five and girl aged three both healthy.

History:

Born full time, weighing $8\frac{1}{4}$ lbs. Is still breast fed, and also has Cow and Gate, cow's milk, puddings, eggs, fruit and vegetables.

Has been ill for four months. At first it was thought to be teething, as mother first noticed baby had an ulcerated mouth. She had two teeth then, and there was no loosening of them.

A rash appeared on the trunk just after this, and mother remarked on the feet and hands being a deep red colour. The baby then became very miserable and fretful, was always crying and wanting to be nursed.

She has gradually become weaker. Before illness she could sit up, but soon lost this faculty. She slept very badly and assumed queer attitudes, such as lying curled up like a ball on her side.

Often her face was buried in her mother's arms, but she was not given to hiding it in the pillow or bedclothes.

Sweating was very marked, and her hands and feet especially were damp and clammy.

During the course of the trouble she had several attacks of diarrhoea.

Loss of weight has been noticeable. At three months she weighed 10 lbs. 14 oz. and at $8\frac{1}{2}$ months 13 lbs. 14 oz. Her present weight is 12 lbs. 11 oz.

Condition on Admission: /

Condition on Admission:

A dark-skinned sallow baby with an abundance of hair and a soft down on back and shoulders.

Face is pallid.

Baby is remarkably quiet and lies in a listless state all day. She seldom cries except when hungry. She takes her food well and also sleeps quite reasonably.

The quietness of this patient is almost uncanny. She seems to take an interest in her surroundings as she follows movement with her eyes, but makes no movement beyond a slow scratching of her abdomen.

She has the air of deep thought that one often sees in cerebral cases.

There is no photophobia.

Sweating is not a marked feature.

Skin: There are a few scattered punctate red spots on abdomen, chest, legs and arms.

The hands and feet are a deep cyanotic colour, swollen, cold and slightly moist.

There is no pitting on pressure. Desquamation is present on hands and feet, and is very marked on the latter.

Mouth and Pharynx: Clean - eight teeth firm in gums. No nasal catarrh.

Glands: Those in groins are palpable.

Heart: Size normal. No murmurs. 140 per minute.

Lungs: Breathing is very rapid - 60 per minute.

Baby has no cough. There seems no infective cause for the rapid breathing as respirations are even and normal everywhere.

No crepitations. Percussion everywhere normal.

May the rapid breathing be of central origin analogous to the tachycardia?

Abdomen: /

Condition on Admission (Contd.):

Abdomen: Nil abnormal. Liver is palpable.

C.N.S.: Cranial nerves normal.

The knee jerks are just elicited with very great difficulty - very much diminished.

Muscles: Extreme weakness and hypotonia.
There is no real paralysis - movements can be performed slowly and with difficulty.

W.B.C. 22,000.

Differential Leucocyte Count:

Eosiniphil	..	.5
Meta-myelocytes		4.5
Band forms	..	8.5
Polymorphs	..	53
Lymphocytes	..	29
Monocytes	..	4.5

Tuberculin reaction negative.

Impression:

A case showing very marked neuromuscular weakness.

The quietness is regarded as a very bad sign.

Progress Notes:

26.7.31. A cinema film was taken of child who remained very apathetic. At one point she tried to prop herself up on one hand, but her muscles failed her and she collapsed.

Was allowed to go home at mother's wish.

Bad prognosis given.

For permission to study and publish the cases at the Babies' Hospital, Newcastle-on-Tyne, I am indebted to the courtesy of Dr. J. C. Spence.

SYNOPSIS of CHIEF FEATURES.

	I	II	III	IV	V
Sex	F	M	M	F	M
Age at Onset (months)	8	6	4	7	4
Initial Symptoms	Catarrh	Stomatitis	Photophobia	Catarrh	General
Skin Rash	+	+	+	+	+
Colour of Hands and Feet	Red	Pink	Pink	Bluish red	Red
Desquamation	+	+	+	+	+
Insomnia	+	+	+	+	+
Anorexia	Slight	-	Slight	-	Slight
Irritability Scratching	+	+	Slight	+	+
Excessive Sweating	+	-	+	+	+
Skin Sepsis	+	-	-	+	+
Temperature	Slight	Slight	Nil	Nil	Slight
Changes in Disposition	Marked	Marked	Marked	Marked	Marked
Photophobia	+	+	++	+	-
Hypotonia	+	++	++	++	++
Knee Jerks	++	+	+	+	+
Tachycardia	+	+	+	+	+
Stomatitis	Slight	+	-	-	+
Naso-pharyngeal Catarrh	+	+	+	+	Slight
Loss in Weight	Slight	Slight	Marked	Marked	Slight
Leucocyte Count	32,000	20,000	18,000	20,000	15,000
Special Features	-	Melaena	-	Melaena 6 times	-
Result	Recovery 2 mths.	Death - Br.Pneum. 6 mths.	Recovery 5 mths.	Recovery 2 mths.	Death - Br.Pneum. 8 mths.

SYNOPSIS of CHIEF FEATURES (Contd.)

	VI	VII	VIII	IX	X
Sex	M	F	F	M	F
Age at Onset (months)	9	13	5	3½	7
Initial Symptoms	General	General - rash	General	General- catarrh	Stoma- titis
Skin Rash	+	+	+	-	+
Colour of Hands and Feet	Hands red	Red	Pink	-	Cyanotic red
Desquamation	-	+	+	-	+
Insomnia	+	+	+	+	+
Anorexia	Slight	-	-	+	-
Irritability Scratching	+	+	+	+	Slight
Excessive Sweating	+	+	+	+	+
Skin Sepsis	-	-	++	-	-
Temperature	Slight	Slight	Slight	Slight	Nil
Changes in Disposition	Marked	Marked	Marked	Marked	Marked
Photophobia	+	-	(1 day) +	++	-
Hypotonia	-	++	+	++	++
Knee Jerks	+	-	++	+	? -
Tachycardia	+	+	+	+	+
Stomatitis	-	-	-	-	+
Naso-pharyngeal Catarrh	Slight	-	+	+	-
Loss in Weight	Marked	Marked	Marked	Slight	Marked
Leucocyte Count	9,000	8,000	19,000	15,000	22,000
Special Features	-	-	-	No rash	-
Result	Death - sudden 7 weeks	Recovery 3 mths.	Death - Sepsis 4 mths.	Near recovery 13 mths	?

Age Incidence:

The disease, as we know it here, in the great majority of cases starts between 4 and 18 months. Most writers give the greatest age incidence as 9 to 18 months, but in eight out of the ten investigated the age at onset was below 9 months.

It is granted that the majority of cases seen are between 9 and 18 months, but in most, careful questioning puts the actual onset several months earlier.

A wider age limit is given as 3 months to 4 years. Cases over 4 are rare, though Zahorsky reports one of 6 years and Bilderback one of $7\frac{1}{2}$, while a case of 14 years is reported from Germany in Feer's latest review of the disease. There the general age incidence seems higher than in this country, the majority of the cases reported by Selter and Feer being between 18 months and 4 years. Cases have been reported in adults by White in America, Wiggelendam and Kuiper, Van Bogaert, Koumans and Sweerts from Holland, but these cannot be accepted as examples of authentic Pink Disease.

The youngest case recorded is that of an infant seen by Wyllie and Stern aged 10 weeks, whose symptoms commenced in the third week of life.

The best idea of the age incidence may be got from the study of Jeffreys Wood's figures. In his /

his two papers he records 131 cases, of which 98 were under 18 months. The rest were between that age and $3\frac{1}{2}$ years.

Mode of Onset:

This varies considerably. The distracted mothers often cannot be very definite about the start of the misery that has enveloped their baby and themselves, but generally the change in disposition is the first symptom to attract attention.

A baby, previously happy, smiling and contented, becomes cross, irritable, sleepless, and shows a distaste for its feeds. These symptoms may progress for a week or two before anything else strikes the attention.

Then sweating of an extreme nature, perhaps accompanied by photophobia and salivation with some degree of stomatitis, adds to the general misery, and, as a rule, the perspiration is accompanied or soon followed by an extensive rash.

The typical condition of the hands and feet is often slow to develop, and may be delayed as long as five months from the onset, according to Wood.

This sequence is now recognised to be that most commonly met with.

The early Australian writers laid emphasis on the early occurrence of digestive disturbances, such /

such as diarrhoea or stomatitis. In two of the ten cases described stomatitis was the earliest thing to attract attention.

In North America, on the other hand, great stress was put on an initial respiratory catarrh. Paterson and Greenfield also recorded this, and said that in most cases there was a history of a febrile illness with catarrh lasting a few days, followed by a quiescent period of even three or four weeks before the general symptoms of misery became apparent. In two cases here recorded there was a history of an initial catarrh, and in one this was very definite and sudden. It is a fact that this acute onset was stressed by the mother who gave the best account of her baby's illness, and it is possible that, as several writers point out, this febrile period may be missed or forgotten. In a third case in the series catarrh and general misery were noticed about the same time.

Clinical Features in detail:

Change in disposition:

This is the most striking feature of the whole disease. The extraordinary change from what was often a model baby to a picture of abject misery is painfully impressive. The pathetic look of the little patients is unforgettable; they whine and cry continuously in a most pitiable fashion. They get

no /

no respite from the intolerable irritation of the skin, and become worn out with a succession of long sleepless nights. The hands and feet seem to be the chief centre of the disagreeable sensations which irritate them, and they are constantly being rubbed against anything available. One foot is rubbed against the other leg, or against the bedclothes or the side of the cot; the hands are rubbed, or the baby chews them in his mouth. The friction and scratching is often carried on until bleeding or ulceration of the skin results.

The rash is extraordinarily irritable, but apart from this the skin seems to be paraesthetic. Unfortunately it is extremely rare to have a patient old enough to describe his sensations, but Bilderback records the case of a boy of $7\frac{1}{2}$ years, who complained of shooting pains in his extremities, and who said that on grasping a glass of cold water he had a feeling like that given by an electric shock.

The irritation affects the cheeks and the tip of the nose, and the face is constantly rubbed in the pillow, till often the tip of the nose is polished like a cherry. This has been noted in cases with no photophobia, and the irritation certainly is a factor in the desire to bury the face and rub it on the pillow or bedclothes.

The hair is constantly being pulled and tugged /

tugged at, and in some cases it comes out in handfuls. It is commonly dry and lacks lustre.

The irritation is the chief factor in the extreme wretchedness of the little sufferers. Sometimes they seem to accept the inevitable, and lie in an apathetic fashion, crying miserably with an imploring appeal in their eyes "like that seen in a wounded animal" (Bilderback). Others become exceedingly restless, and throw themselves against the sides of their cots, or strike viciously at their mothers, even trying to bite them, according to Wood, so great is the provocation of the continued irritation.

They appear to gain some relief from gentle rubbing of their feet and hands by the mother or nurse; older children have been known to ask to have them dipped in cold water.

They may show a certain interest in their surroundings for a few moments, but soon an expression of pain comes over their features, and is followed by a renewed outburst of crying. Any attempts to play with them or to try and make them comfortable are resented as a rule by screaming.

Observers in this country generally agree that the mentality remains normal; the victims follow movements with their eyes, and show average intelligence for their respective ages. Woringer, however /

however, quotes cases in older children whose mentality appeared changed. They kept repeating meaningless phrases, and lost affection for their parents.

The expression of intense misery on the faces of these children, intensified as it often is by running nose and eyes and dribbling from the mouth, is almost pathognomonic. The like of it is never seen in any other disease. A smile is a red letter event indeed, and often the first sign of coming recovery.

Disturbances of Sleep:

Insomnia is an early and very persistent symptom. Mothers will say the baby has never slept for months. Probably the irritation is responsible, as the sleep tends to return during the later stages. The ordinary hypnotic drugs, even morphia, have very little effect on the insomnia when it is marked.

The long succession of sleepless nights takes its effect on the child's parents, who get worn out and exhausted. It has been said that the appearance of the mother is a point which ought to help the diagnosis.

Cases have been reported where the cycle of sleep is reversed, as in epidemic encephalitis.

Anorexia: /

Anorexia:

The early writers, Byfield, Bilderback, Zahorsky, and Paterson and Greenfield all remarked on the extreme and obstinate anorexia.

In the cases observed this was by no means a prominent symptom, only one out of ten giving any real trouble in feeding. Some degree, of course, is invariable at first, but considering the general state of woe the appetite is often retained to a surprising degree.

However numerous cases are recorded in the literature where forced feeding has had to be adopted.

One cannot believe that the anorexia is the sole cause of the loss in weight which is almost constant; cases have continued to lose weight when taking their food well, and it is doubtless connected with the general wasting and muscular weakness, and of central origin.

Photophobia:

This is a very striking symptom, and is fairly constant at some time or other during the course of the disease. It may come and go several times.

In one case (No. VIII) it was noticed for twenty-four hours only, and that a week before death. In two (Nos. III and IX), it was very intense and persistent, and in one of these (IX) the diagnosis was /

was largely dependent on this symptom.

As a result the baby adopts several typical attitudes, such as lying with the face buried in the mother's breast, or in the pillow or bedclothes.

The frowning expression with lowered eyebrows common in Pink Disease may lead one to believe a patient has photophobia, which may thus be more apparent than real in some cases.

It would seem to be independent of any conjunctivitis, although the latter is quite common. Profuse lacrimation is the rule in severe cases.

Jenny reports that in some patients corneal defects were visible by the fluorescein test; this could not be confirmed in any case here.

Byfield reports a neuro-keratitis; this is also noted by Pehu and Ardisson.

Zechlin describes a case which had a herpetic eruption on the left cornea, which progressed to ulceration eventually necessitating removal of the eye.

The pupil reactions and muscular movements of the eyeballs are invariably normal.

Retinoscopy is negative.

Photophobia is usually an early symptom, and by the time the typical picture is established it has very often disappeared, or is merely slight in degree.

Sweating: /

Sweating:

This is so extreme that often the patient's clothes and the bedclothes have to be changed three or four times a day. Probably in no other disease is it so drenching and so constant. It is often accompanied by a peculiar odour which has been described as "mousy".

The excessive perspiration is an early symptom as a rule, and is often accompanied by a profuse general sweat rash over the whole body, consisting of tiny vesicles with a reddish areola. The sweating and the rash seem to appear and disappear in cycles during the course of the disease.

As a result of the profuse sweating the skin becomes sodden and macerated, and has a damp clammy feel.

This remarkable symptom must be due to a hyperactivity of the sympathetic nervous system.

Stomatitis:

This is a very common finding, and in two cases of the series was the first thing to attract attention. It may, however, appear late, and Wood thought it might be secondary to sucking infected fingers.

Small ulcers are found on the tongue, gums and the buccal mucosa generally. If not carefully attended to, the mouth may become very dirty and foul smelling. /

smelling. In extreme cases extensive ulceration may occur, and Zahorsky reported a case of cancrum oris where part of the lower lip separated as a necrotic mass and there was also extensive necrosis of the mandible.

Teeth may drop out without any primary inflammation of the surrounding gums, and sometimes half or more of the teeth present are lost in this way. This would seem to be a trophic phenomenon. Secondary infection of the gums may follow, and lead to ulceration and necrosis. The secondary teeth may be exposed by this.

In other cases, where the teeth are apparently firmly fixed, the gums become red, spongy and inflamed.

Zahorsky records another case where a deep ulcer of the tongue was followed by death from sepsis.

Salivation is nearly always marked, and the baby dribbles constantly. There is usually a wet patch on the bed or pillow due to this.

The pharynx is as a rule congested, and some degree of naso-pharyngeal catarrh, varying from a thin watery discharge to one frankly purulent, is almost constant. Nasal sinusitis resulting from this is quite often reported, and may require surgical intervention.

The early American writers made much of a tonsillar infection, and Rodda in particular laid great /

great stress on this. He maintained that the disease was a toxaemia resulting from an upper respiratory infection usually localised in the tonsils, removal of which resulted in speedy recovery in all cases. Wholesale tonsillectomy does not now meet with general approval. In none of the ten cases described did the tonsils seem abnormal.

The Skin Rash:

The rash, as previously described, may appear several times during the course of the disease, and it seems to come and go with the sweating.

The whole body is covered as a rule, though the face often escapes. The arms and legs, the chest, abdomen, back and neck are usually thickly involved.

The character of the rash varies, and two distinct types might almost be described. There is the sweat rash - tiny little red spots which tend to become raised vesicles surrounded by a reddish areola. This is very common.

At other times the rash is more definitely of the maculo-papular type - the spots darker red and larger. These are more often seen on the forearms and legs, and most typically on the dorsum of the hands and feet. When this rash is generalised in the early stages, a diagnosis may be made of German Measles, Scarlet, Measles or even Urticaria.

Distinct /

Distinct again from this there appear often in the later stages scattered vesicles, which soon crust over, or become distinctly septic. They start as a tiny papule, and quickly spread to the vesicular stage in a few hours. Small skin ulcers may result from these, and sometimes spread with astonishing rapidity. This quick destruction of tissue suggests a trophic lesion.

The appearance of this skin sepsis is often the climax of the disease. Either the patient goes quickly downhill, or the other symptoms tend to improve, and, when the septic process has ceased to extend, recovery is rapid.

The "Erythroedema" of the hands and feet:

This condition, once fully established, is absolutely pathognomonic, and clinches the diagnosis beyond all manner of doubt.

In most cases it is noticed soon after the skin rash, but in some it is rather delayed, and Wood has seen it develop as long as five months after the onset.

It is not absolutely constant. One case of the series (No. IX) had never any suspicion either of a rash or of changes in his hands and feet during an illness which lasted over a year, while his brother died six years previously of Pink Disease, and he also had no skin changes. In neither case could the diagnosis /

diagnosis be reasonably in doubt. Jeffreys Wood records a case which recovered in three months without any skin changes.

The hands in a fully developed case are swollen, or rather, enlarged, moist, cold, and of a reddish colour varying from light pink to deep bluish red. This colour varies very much. Even in one case it may change in a few hours from one extreme to the other. This is probably a vasomotor phenomenon, and the cyanosis due to capillary stasis. In the same way the hands may be red and the feet bluish, or vice versa. The differences in colour may even be seen between the two hands or the two feet.

The feet show similar changes, but as a rule the degree of these is not so marked as in the hands.

The redness is remarkably symmetrical and is limited below the wrists and ankles. The red colour gives the hands and feet a raw glazed appearance, and they have been described as "raw-beef", or "as if they had been dipped in boiling water". The impress of the finger on the red surface causes blanching, and the blood returns slowly to the area, but there is never pitting on pressure.

Often the redness is limited to the palms and fingers, soles and toes, and the dorsum of the hands and feet show the papular rash. These tiny papules are also seen standing up from the red background, while between the fingers and toes vesicles are /

are frequently observed.

The skin between the fingers and toes may become sodden and macerated, and this may give rise to septic ulcerations.

The "erythroedema" of the hands and feet waxes and wanes, and may appear several times in a protracted case.

The skin of the cheeks and the tip of the nose are affected in many cases and become pinkish red. The tip of the nose is often very shiny through rubbing it on the pillow. This is by no means a constant finding, and in many of the cases described here a curious "exposed" condition of the face was observed, as if there had been much exposure to sun, wind and rain.

Desquamation:

This is a sequel to the rash and the changes in the hands and feet. It is always present to some degree, usually in the later stages of the illness. On the body it occurs in a fine pin-point variety, and may not be very noticeable. The cheeks and nose usually show well-marked peeling in cases where their redness has been a feature.

On the hands and feet, however, it is of a different type, and resembles the desquamation seen after scarlet fever. The skin comes off in large strips, and the little patients often spend long stretches /

stretches of time picking the skin from their hands and feet.

When desquamation has started on the raw red extremities the picture is unmistakable and could never be confused with anything else.

Shedding of Nails:

In severe cases the loss of finger and toe nails has been recorded. Wood reports a case where the toe nails were shed five times during a thirteen months' illness. This is analogous to the falling out of the teeth and is a trophic phenomenon. It has not been observed in this series.

Neuro-muscular Changes:

The most striking of these is the extreme hypotonia. One would indeed class this as one of the chief features of Pink Disease. It is a constant finding once the malady is fully developed, and advances gradually till the most extreme stage may be reached.

Depending on what stage the child has reached before taking ill, the faculties of walking, standing, and perhaps even sitting up, are lost. The motor power of the muscles becomes too weak to support the body in these postures. This weakness may progress till the little patient lies practically motionless, save for a few slowly performed movements to relieve the irritation.

As a rule there is no true paralysis observed; the movements can be carried out, albeit slowly and with difficulty owing to the tonelessness and wasting.

However, Schwartz of Milwaukee in 1929 reported a case which had a motor paralysis of the legs and unequal pupils. It recovered after tonsillectomy. This case is exceptional, though Wyllie and Stern quote another in their recent paper.

As a result of the hypotonia certain curious and very typical attitudes are seen.

The jaw muscles are weak, resulting in a perpetual droop, and the mouth hangs open "like a young gosling". The neck cannot support the head, which falls forward, and a further degree of this posture is seen when the whole trunk is bent almost double until the head is right between the legs, and thus the child will lie for long periods at a time. This is very characteristic of Pink Disease, and has been termed the "knife rest position".

Another favourite attitude is lying all curled up like a young kitten, with the head at the wrong end of the cot and the face buried in the bed-clothes.

Owing to the hypotonia the legs and arms can be moved into almost any position. The muscle wasting is very marked in the adductors of the thigh, and /

and the skin covering this region commonly hangs in loose folds.

One feels that the muscular wasting has more to do with the loss of weight than the anorexia, which is not nearly so striking a symptom.

Owing to the hypotonia the contents of the abdomen can be palpated with astonishing ease.

A fine tremor affecting the hands and feet has been noted by Feer in many cases.

There is rarely any alteration in the eye movements. Squint is recorded in some cases, but this is very common in young babies quite apart from Pink Disease.

The pupil reactions are always normal.

The knee jerks are usually present, as are the ankle jerks. In several of the cases observed there was an exaggerated response such as one meets with in lesions of the pyramidal tract, and in the majority they were noticeably brisk. A little patience may be required to elicit them owing to the constant squirming movements of the legs made in an endeavour to relieve irritation.

In one case of the ten (No. VII) the right knee jerk was definitely absent for a fortnight, while the left one could be got occasionally. After one response it became negative on again tapping the tendon /

tendon, as if the reflex had become exhausted. On leaving the child and testing again in two or three minutes the response was again present on the first tap.

In another case (No. X) the knee jerks were only just present occasionally. Unfortunately this case was only under observation three days, during which the muscular weakness was most extreme.

A point worthy of emphasis is that the neuromuscular condition does not seem always to correspond with the progress of the other symptoms. In case No. VII the patient was noticeably improving, while the legs were getting weaker.

The earlier writers, and Paterson and Greenfield in particular, gave diminished or absent knee jerks as a constant finding in established cases. One feels this is not an accurate observation; in many cases the knee jerks are exaggerated, and only in a certain number are they diminished or lost.

The question of loss of cutaneous sensibility is most difficult to decide in young babies. One's personal experience is that in most cases a pin-prick is resented with emphasis. In one case, however, the patient actually fell asleep while the heel was being pricked for a blood count.

Hyperaesthesia and paraesthesia, especially
of /

of the hands and feet, are commoner than anaesthesia, and older children are reported to complain of actual pains in the legs and arms.

Trophic changes, such as the falling out of teeth and hair, the shedding of nails, and ulceration of the skin and mouth, have already been described.

Several writers have reported symptoms suggesting meningeal irritation as occurring at the onset. The German writers, and notably Selter, record cases starting with spasms of an epileptiform nature and usually unilateral, convulsions and loss of consciousness. It is questionable whether these cases with pronounced cerebral symptoms are true examples of Pink Disease.

Glandular System:

Vipond lays stress on a general enlargement of the lymph glands throughout the body in the early stages before the appearance of the skin changes. He has isolated a diplococcus from the glands, and uses a vaccine made from this organism in treatment.

His findings have not met with general confirmation, and one's personal view is that the glands found very often in the groin, and occasionally in the neck, are due to a superadded skin infection in the former situation, and in the latter to ulceration in the mouth or the naso-pharyngeal condition.

Respiratory System: /

Respiratory System:

The very marked tendency to naso-pharyngeal catarrh has already been noticed. There is also a distinct susceptibility to bronchial infections, and broncho-pneumonia is always dreaded. It would seem to be a very real danger in Pink Disease, and many deaths are attributed to it.

In one case of the series (No. X) a rather remarkable rapid respiratory rate was noted without any evidence of an infective process to account for it. A suggestion is made that this may be of central origin and analogous to the tachycardia.

Digestive System:

The anorexia has already been discussed, as have the salivation and changes in the mouth.

The earlier Australian writers emphasised digestive symptoms at the onset with irregularity of the bowels, diarrhoea being more common than constipation.

Vomiting is uncommon except in the presence of a secondary infection.

Thirst is very marked owing to the loss of fluid with the severe sweating.

There would seem to be a distinct tendency to disturbances of the muscular movements of the intestines. There are many references in the literature to the occurrence of intussusception, very often /

often a fatal complication. One case of Pink Disease in hospital here two years ago was operated on twice for intussusceptions within three months, and survived both times, eventually making a complete recovery to health.

In one of the series described (No. IV) there were six distinct attacks of abdominal pain, followed by the passage of blood per rectum. This also was recorded on one occasion in another case (No. II). In Case No. IV the blood was mixed with faeces on every occasion. One feels that an explanation of these attacks can be only conjecture; an intussusception afterwards reducing itself is perhaps possible.

Anal spasm is recorded quite frequently; other writers report prolapse.

On palpating the abdomen nothing noteworthy is made out. Perhaps the spleen and liver may be felt more often than is usual, but this is due to the hypotonia making examination easy.

Circulatory System:

In no case has any alteration in the size of the heart or the character of the heart-sounds been noted, but there is a remarkably constant tachycardia which persists throughout the disease, and often indeed is the last abnormal sign remaining after all others have disappeared.

One would say that 130 to 160 was quite a usual pulse rate in Pink Disease, and 170, 180, or even 200 not uncommon. The rate does not fall more than ten beats per minute during sleep, and thus cannot be ascribed to the extreme restlessness so often present. It is also to a large extent independent of temperature, as it is rare for the latter to be much above 99° - 100°F., and quite often it is normal.

The Blood Pressure is reported to be raised in all cases, and the systolic reading is said to reach 120, 140 or even 150 mm. of mercury. It was Feer who first drew attention to this. This is a valuable sign in older children, say over two years, but one found it was impossible to get observations of any value in babies under a year owing to the extreme restlessness and continual crying, and finally the attempt was abandoned.

According to Feer the raised blood pressure runs a course parallel with the tachycardia, and falls very gradually during convalescence.

Examination of the Blood:

Many observers report high red counts up to 6 million per c.mm., and even higher. This is said to be due to the severe sweating causing a thickening of the blood. Certainly in Pink Disease clotting occurs very quickly and it is very difficult to get the /

the blood for examination.

The Haemoglobin estimation usually gives a percentage of 80 - 90. A secondary anaemia is not uncommon, and in one of the cases recorded here it was down to 55%.

There is a well-marked leucocytosis in most cases. In the series of ten the counts varied from 8,000 to 32,000, and always tended to be higher in the presence of a secondary infection. Where cases were seen very early the leucocyte count approached more nearly to the normal.

The differential count is generally reported to show a marked increase in polymorph neutrophils. This may apply to older children; in this series one found in all but one that the majority of the cells were small lymphocytes.

The granular cells were found to show a distinct "shift to the left" in most cases, the cells with a band-shaped nucleus occurring in percentages up to twenty of the total count.

Urinary System:

A trace of albuminurea is very common at some time in the course of the disease. Pus cells are also found with fair frequency. The daily output is diminished owing to the sweating, and this fact, combined with a deficient resistance to infection, tends to produce a pyelitis on occasion.

Lapage draws attention to the urine being often a curious golden orange tint during convalescence.

Frequency of micturition is commonly reported.

Certain Continental writers have from time to time reported the presence of sugar in the urine.

None of the ten recorded cases had any urinary symptoms.

Temperature:

This is usually either normal, or perhaps more commonly slightly raised and running between 98° and 100°F. The disease may begin with a short febrile period, but when fully established a well-marked temperature usually indicates some complication or secondary infection.

Metabolism - Biochemistry of Pink Disease:

Feer points out that the metabolism in Pink Disease is increased, and is analogous to that of Hyperthyroidism.

The blood sugar has been found by him to be from 120 - 150 mg.%. One case after the administration of glucose showed a diabetic curve, the blood sugar rising to 280 mg.%.

The blood calcium is often 11 - 12 mg.%, and the phosphorus 3.5 mg.%.

Byfield reported the gastric contents as being /

being of normal acidity, while Feer states that it is invariably diminished.

Brown, Courtney and McLachlan report an excessive nitrogen loss in the urine.

The cerebro-spinal fluid shows nothing of note on analysis.

Bacteriology:

The naso-pharyngeal discharge has not been found to contain any specific organism. All writers are agreed that the diphtheria bacillus is not found in the throat.

Vipond's diplococcus from the glands has already been referred to. It is cultivated on human blood serum, and is found after 48 - 60 hours in the water of condensation. It is Gram positive.

Interesting results were reported in the South African Medical Research Institute report for 1928. Culture of capillary blood from the red hands and feet yielded a haemolytic staphylococcus aureus and a Gram positive kidney-shaped diplococcus, which latter organism was also recovered from the urine, faeces and a gland of one case, and from the tonsils of the other two. Only three cases were investigated.

Inoculation of fresh cerebro-spinal fluid from one case into a monkey caused loss of fur, emaciation, and death in two months.

No further report on this work has been traced.

Course of Pink Disease:

The disease varies very considerably in severity. An average mild case usually recovers completely in two to three months, but the more severe cases may drag on for many weary months. One case of the series lasted over a year, and at the time of writing is not yet fully recovered. Several cases have been reported lasting as long as two years.

Those cases with severe trophic changes and pronounced neuro-muscular disturbances run a very protracted course.

The irritability and insomnia and general misery are usually the first symptoms to show improvement. The changes in the hands and feet may be slow to disappear, while the tachycardia, hypotonia and tendency to respiratory catarrh are very persistent.

The tachycardia may still be present long after everything else seems normal.

A point which always causes anxiety is the undoubted tendency to sudden unexplained death. All writers on the subject are agreed on this, and as a rule autopsy shows nothing to account for this.

In a recent paper, however, Wyllie and Stern record a case which died very suddenly, and on detailed examination of the nervous system extensive degenerative changes were found in the vagus nerve.

Apart from this sudden death danger, secondary infections, and, in particular, broncho-pneumonia /

pneumonia, tuberculosis and septicaemia, account for most of the fatal cases.

In the series of ten cases here described there were four deaths, two from broncho-pneumonia (one of these rather sudden), one from sepsis, and one which died very suddenly after only seven weeks' illness.

Five made good recoveries after illnesses lasting from two to thirteen months.

The tenth case when last seen was very ill, and it was considered very likely to terminate fatally.

Diagnosis:

Little need be said about this. In a fully established case it can hardly be missed by anyone who has previously seen a case, while in the early stages it is practically impossible.

Suspicion of Pink Disease ought to be raised by intractable insomnia with extreme misery and, perhaps, in addition, severe sweatings. In the early stage the rash may be mistaken for scarlet, measles or German measles.

The absence of certain symptoms need not make the diagnosis doubtful. In Case IX there was no rash, and the hands and feet were normal, but the misery, photophobia and hypotonia were so marked and characteristic as to exclude any other possibility.

Cases of photophobia, for which an ophthalmologist can find no apparent cause, occurring in young babies should be regarded as possible Pink Disease, and watched for further symptoms and signs.

It is very likely that there are a great many cases of a mild and abortive nature which pass unrecognised.

Prognosis:

This has been considerably modified of recent years. The earlier writers gave a good prognosis, and the mortality was generally reckoned as about five per cent.

Byfield in his early paper had seventeen cases with three deaths. Wood and Cole in 1920 reported ninety-one with five deaths. However in 1927 Wood said he had changed his ideas on prognosis, as of the last thirty-one cases in Melbourne ten had ended fatally.

Sweet recorded fifteen deaths out of sixty-one cases occurring at Sydney during 1927 and 1928.

The latest German and Swiss writers still place the mortality at about five to ten per cent. One feels this to be an under-estimate.

In the prognosis of an individual case a sudden unexplained apathetic quietness must be regarded as very ominous.

Morbid Anatomy and Histopathology:

The earliest examination of the nervous system was made by Byfield in a case which died of pulmonary tuberculosis. This showed involvement of an occasional anterior horn cell, gliosis round the central canal of the spinal cord, and oedema of the sensory roots with swelling of the myelin sheaths.

Wood reported largely negative findings in three autopsies in his 1920 series. This is in accordance with general opinion that surprisingly little is often found at autopsy. Apart from signs of a terminal infection such as broncho-pneumonia, naked eye examination is completely negative in most cases.

The first important contribution to the Pathology was that of PATERSON and GREENFIELD, who gave a very full account of two cases which came to autopsy. They found considerable myelin destruction in some fibres of the peripheral nerves, and a diffuse small-celled infiltration of the grey matter of the cord, specially marked in the lumbo-sacral enlargement. The nerve roots also showed cellular increase.

In one of the two cases grave changes were found in the anterior horn cells supplying the distal portions of the limbs. These changes consisted of moderate chromatolysis with eccentricity of the nuclei and vacuolation of the cell cytoplasm. This appearance /

appearance was thought to be an "axonal reaction".

The infiltrating cells in the cord were considered to be of glial origin, while those in the nerve roots appeared to be derived from the nucleated sheath of Schwann.

A great increase of cells was also reported in the degenerated calf muscles, and was attributed to multiplication of the sarcolemmal nuclei.

They summarised their findings as giving evidence of a peripheral neuritis, with chronic inflammatory changes in the cord and nerve roots, in which the sensory nerve fibres were more affected than the motor.

BUTLER in 1925 published the report of a biopsy from the skin of the hand, which showed hyperkeratosis and oedema of the corium.

JENNY in the same year gave the post mortem findings in a case from Switzerland, but nothing noteworthy was found.

Then came a very full and excellent account by WARTHIN of the detailed necropsies of two cases. His findings did not altogether tally with those of previous writers. He reported oedema of the brain and meninges, but no degenerative or inflammatory changes were found in the brain, cord or peripheral nerves. Nor were any changes found in the striped muscle fibres.

The thymus showed marked fibroid atrophy, and /

and there was hypoplasia of the medulla of the suprarenals, and also of the chromaffin tissue in the suprarenals and ganglions. General hyperplasia was found of all lymphnodes with marked exhaustion of the germ centres.

The skin showed marked hyperkeratosis and hyperplasia of the epidermis; capillary dilatation and hypertrophy; perivascular reticulo-endothelial proliferation; no oedema of the corium; hypertrophy and dilatation of the sweat glands. Warthin thought these skin changes suggested an early erythema stage of pellagra, or certain forms of light sensitisation.

He summarised his findings as suggesting the result of a food deficiency or toxic state acting on children of hypoplastic constitution, and affecting the reticulo-endothelial system of meninges and skin and vegetative nervous system, and possibly leading to a light sensitisation.

WORINGER from France described one autopsy in which the most striking feature was hyperfunction of the sympathetic (chromaffin) system and of the hypophysis.

The next important contribution came from KERNOHAN and KENNEDY of the Mayo Clinic in 1928. They give the findings of one case in great detail. It showed fragmentation of the myelin sheath in the peripheral nerves of the extremities, especially the sciatic /

sciatic and femoral. Marked changes were found in the nerve cells of the dorsal root ganglions in the lumbar region, and to a lesser degree at other levels. The anterior horn cells in the sacral region were also affected. An increase in the number of glial cells in the cord was noted at levels corresponding to the chromatolysis of the ganglion cells, which seemed due to axonal degeneration.

Chromatolytic changes were also reported in the mid-brain, basal nuclei, medulla and in the Gasserian ganglia. The cerebral cortex and cerebellum were normal.

Unfortunately they did not examine the sympathetic or vasomotor nervous systems.

FRANCIONI and VIGI found cellular infiltration in the region of the cervical sympathetic ganglia of the nature of perivascular cuffing. They also reported degeneration of the ganglion cells in the mid-brain, especially in the regions of the Infundibulum, Tuber Cinereum and the Hypothalamus.

A very interesting case is quoted by these authors of a child aged $4\frac{1}{2}$ years who developed Pink Disease within a few weeks after an attack of encephalitis. Autopsy showed typical findings of epidemic encephalitis, and, in addition, infiltration of the cervical sympathetic ganglia with lymphocytes.

The latest work on the Pathology has been recently /

recently published by WYLLIE and STERN from London. They report the findings in seven fatal cases.

In four, degenerative changes in the peripheral nerves were noted. In one interesting case, which had died suddenly, the only degeneration was found in the vagus nerve.

Cellular infiltration of the cord was found in all cases, and was similar to that described by Paterson and Greenfield. The cells resembled glial cells rather than lymphocytes in staining reactions, but no processes could be demonstrated.

Chromatolysis of anterior horn cells, most marked in the lumbo-sacral region, was present in five cases out of seven. Again this is thought to be an "axonal reaction".

Two cases showed a small-celled infiltration of the grey and white matter of the cortex, of the basal ganglia and of the medulla. These are the only two cases in the literature which record changes in the cerebral cortex.

They question the accuracy of Kernohan and Kennedy's findings, thinking the reported degeneration of the cells in the mid-brain very doubtful.

The significance of the small-celled infiltration of the spinal cord, which is a finding common to most pathologists, is not explained.

Thus certain quite definite organic changes are /

are recorded in the central nervous system, and also, according to certain authors, in the sympathetic system.

Etiology and Nature of the Disease:

The age incidence has already been discussed. It is essentially a disease of the period of the primary dentition. As regards sex, writers with big experience, such as Wood and Feer, agree that it is slightly more common in boys, but no conclusion is possible from this.

It is generally held that Pink Disease has a definite seasonal incidence, and that the onset in the majority of cases is between the months of November and April in the Northern hemisphere. This of course is the season of catarrhal infections, and also the time when the hours of sunshine are few, and the resistance of the body to disease tends to be lowest.

Pink Disease might be described as a new disease. It has only been known in this country since the War, and only in Australia was it commonly recognised before 1920.

Byfield and Bilderback in America, and Feer and Haushalter on the Continent, have stated that they had seen the condition as far back as 1911, and Australian observers had evidently known it even previous /

previous to that, but it has only come into general prominence in the last ten years.

During this decade it has been reported from nearly every country in Europe, from both North and South America, from Australia and New Zealand, from South Africa.

In America most of the cases have been reported from the North West and Middle West; nearly all the German cases have come from the extreme West; while in England Pink Disease is certainly more common in the industrial areas of the North than elsewhere. Tyneside, the Leeds district and Lancashire appear to be the centres of greatest incidence. Pink Disease is rare in Scotland.

On Tyneside it has been noticed that certain villages round Newcastle seem to supply an abnormally large proportion of the cases seen; comparatively few cases are seen in Newcastle itself. This agrees with the observation of German writers that the disease occurs in a curious sporadic fashion in small villages rather than in the large towns.

There does not seem to be any direct relationship between poverty and the disease. At a casual glance it might be thought that the prevalence of Pink Disease in those districts of England which are suffering most acutely from the industrial depression indicates the reverse, but the probability is /

is that poverty, by lowering the vitality and resistance, tends to produce an increased susceptibility to most illnesses. Cases of Pink Disease have occurred in the well-to-do classes, and most of those personally observed occurred in the respectable artisan class, where there was no extreme poverty, and the children were obviously well cared for.

This brings one to the question of feeding. Without exception, every case seen had been fed in a manner beyond reproach. All the cases but one had been breast fed, and in most the symptoms started while the babies were actually on the breast. The supplementary feeding had been on recognised lines, and, as a rule, additional vitamins had been supplied in the form of cod liver oil, orange juice, ostelin, etc.

The theory has been put forward by several observers that Pink Disease is an avitaminosis or deficiency disease. Weston in America appears to favour this view, and Zahorsky and McLendon claim good results on treating cases with yeast. Irradiated ergosterol was also given by McLendon.

Findlay and Stern have produced a disease in the rat, which has points of resemblance to Pink Disease in the human child, by feeding the animals on a diet complete in every respect save that the sole source of protein was supplied by fresh crude egg white /

white which had been dried.

Post mortem a small celled infiltration was found in the spinal cord of the rats, very similar to that reported by Paterson and Greenfield in Pink Disease.

The administration of raw potatoes, yeast, raw egg white or egg yolk was found to be capable of preventing the onset of symptoms.

A daily ration of 5 ccs. of ~~summer~~ milk cured the disease, but the most rapid cure was obtained by adding raw liver to diet.

Further interesting work has been done by Reader lately. She has been successful in isolating a vitamin she calls B₄, and on being deprived of this the animal shows general muscular weakness, spastic gait, swollen red paws, and a tendency to sit in a hunched position. At present this concentrated B₄ is being tried on cases of Pink Disease in Newcastle.

In a personal communication the author states that she at present hesitates to claim that Pink Disease is the result of deprivation of B₄, but the investigation is of considerable interest, and more suggestive than that of Findlay and Stern.

Wyllie and Stern have been feeding their cases lately with liver, following the report of Findlay and Stern on their results with the rats. Good results are claimed, and they think that the dietetic /

dietetic factor in liver is of value in cure. Of the nature of this factor they are unable at present to judge, nor can they say whether a deficiency of it can cause the disease in the absence of a positive factor, probably infective.

All the clinical evidence at the present time is strongly against Pink Disease being due to any error in feeding or lack of vitamins. Case reports showing any error in diet are very rare, and aggregated observations of clinical cases must weigh more strongly than experimental work on rats. The only thing that might lead one to favour the avitaminosis theory is the age incidence - the period of the primary dentition - but there is no other evidence to support this.

The most prevalent view is that Pink Disease is an infection. The early writers suggested that it might be a sequel to the influenza pandemic of 1918, but this view of course cannot now be held.

It has been clearly shown by numerous observers that the diphtheria bacillus has no part in the etiology. The search for a specific organism in the naso-pharynx has failed, the findings as a rule being the common catarrhal strains.

Vipond, of course, claimed specificity for his diplococcus, which he isolated from enlarged glands. His results have not been confirmed by any other /

other writers, and are regarded as doubtful.

The research work already referred to from South Africa in 1928 was suggestive, but further reports from there have been lost sight of, and cannot be found in the literature.

In quite a large proportion of cases there is an initial respiratory catarrhal stage, and naso-pharyngeal discharge is very persistent throughout the illness in most cases. This would seem to suggest that the infection gains access to the body by the naso-pharynx, a view held by the great majority of American observers. Rodda in particular laid stress on a focus of infection being situated in the tonsils. He held that tonsillectomy invariably brought about rapid cure, and that its performance in the early stages would abort the disease. Many other writers have supported Rodda's view.

In the series of ten cases described here, none showed any obvious tonsillar sepsis, and the prevailing present day opinion is against wholesale tonsillectomy. If an obvious focus of infection exists, it should naturally be dealt with. In the same way nasal sinusitis may demand surgical intervention. But the view that removal of tonsils cures every case of Pink Disease is not now in favour.

Littlejohn of Australia in 1923 put forward the theory that it was an infectious disease of the nervous /

nervous system, analogous to infantile paralysis and epidemic encephalitis, and involving especially the vasomotor centres in the medulla. This explanation has become very popular in the last few years, and there is certain evidence to support it.

Pink Disease occurs in a curious sporadic fashion similar to the other two diseases, and certain post mortem findings (Kernohan and Kennedy, Francioni and Vigi) are suggestive.

Feer first put forth the theory that it was a disease of the sympathetic nervous system. Certainly very many of the symptoms can be explained by this, as the following table shows:-

<u>Overaction of Vagus.</u>	<u>Overaction of Sympathetic.</u>
Extreme perspiration.	Tachycardia.
Salivation.	Raised Blood Pressure.
Apathy, depression, fatigue.	Insomnia.
Moisture and coldness of hands and feet.	Tremor.
Alternating cyanosis and erythema of hands and feet.	Raised blood sugar) Raised blood calcium) ^{Feer}

Feer suggested the term "vegetative neurosis," believing it to be a functional disturbance of the sympathetic nervous system - functional because he had failed to find any organic changes at an autopsy.

Both Selter and Feer still hold that the disease is caused by a disturbance of function rather than structure, though Feer, in his latest review, is at /

at pains to point out that this by no means rules out the infective theory. Indeed he rather inclines to the latter, holding that the toxaemia from an infection could account for the disturbances of function.

Janet and Turquety, writing from France recently, maintained that Pink Disease was an infection by a neurotropic virus gaining access through the naso-pharynx and affecting the vegetative mid-brain centres. Most of the French and Italian writers agree with this theory, and Francioni and Vigi bring forward their autopsy findings to support it.

An interesting comparison with epidemic encephalitis is raised by a case quoted by Binet of a child who was vaccinated at the age of sixteen months. A month later he developed a generalised vaccinia, and at nineteen months Pink Disease.

Péhu and Mestrallet summarise the evidence for the theory of a neurotropic virus akin to that of encephalitis in an excellent article published early this year (1931).

This is a fascinating theory, but one must not forget that the pathological evidence of an affection of the sympathetic centres is as yet very slender, and the most constant finding post mortem would seem to be the small celled infiltration of the cord, while both Paterson and Greenfield and Wyllie and Stern have laid stress on the peripheral nerve changes. /

changes. These tend to be more and more marked the longer the disease has been in progress, and suggest a chronic degenerative process rather than an acute one.

The position would seem to be that the supposed virus, if one may judge by the symptomatology, attacks the mid-brain centres at the onset, while later on, changes may occur in the spinal cord and peripheral nerves. Thus both the sympathetic and central nervous systems are involved.

Though it is generally agreed that Pink Disease is an infection, evidence of direct transmission has rarely been proved. Jeffreys Wood tells of a case where a child was taken to a room where another child lay ill with pink disease, and a month later the visitor himself developed the disease. Wood and Feer have both seen two cases in one family, but always at an interval of two to three years. In this series, Case No. IX developed Pink Disease in 1930; a child in the same family died of it in 1925.

Still, though direct evidence is hard to get, the curious sporadicity in small villages, the frequency of a sudden febrile onset, and the leucocytosis all suggest an infective basis.

To sum up, Pink Disease is probably an infection which gains entrance to the body through the naso-pharynx and causes certain changes in the nervous /

nervous system. The sympathetic system is early affected, and in prolonged cases changes in the central nervous system and the peripheral nerves may occur.

Whether the changes in the nervous system are functional, and due to a toxæmia from the infection, or organic, and due to a neurotropic virus similar to that of epidemic encephalitis, is not at present definite, and what is most required to solve the problem is further pathological evidence.

All things considered, the theory of a neurotropic virus seems the more probable one. It can be said with conviction that Pink Disease is a definite clinical entity, and so the infection is the more likely to be specific.

Treatment:

The main essentials in the treatment of Pink Disease are skilled nursing, a nourishing diet, and a special effort to shield the little patients from secondary infections.

The nursing of a case makes great demands upon the nurse or mother, as the case may be. The persistent insomnia is often a problem, and the tincture of opium in minim doses for young babies has often to be resorted to. Fair results have been obtained with luminal, and chloral, often the best hypnotic /

hypnotic in children, may be effective, but too often nothing seems of any avail.

If the intolerable irritation can be alleviated sleep often follows, and a calamine lotion or cream is often the best means of soothing this.

The body should be clad lightly, and wool avoided as far as possible. Frequent changes of clothing are a necessity. Gloves and socks for the hands and feet prevent scratching to some extent.

The mouth often requires special cleansing, and, where there is marked ulceration of the gums, painting them with 1% chromic acid, as advised by Fowler, is helpful.

Forced vitamin feeding has given rather disappointing results, and the ordinary diet for the age of the child answers just as well, with cod liver oil as an addition.

Owing to the danger of infections, one feels these cases are better at home, and hospital treatment is not advisable where the home conditions are good and the mother is able to cope with the situation.

Such are the general lines of treatment which were followed in the series of cases described.

Many other alternative methods of treating the symptoms have been advocated.

Wood recommends treating the skin with spirit followed by powder, and painting the hands with equal parts /

parts of tincture of iodine and methylated spirit. He claims that the latter lessens the tendency to septic infection of the skin generally, and also to stomatitis. Splinting of the elbows may be necessary to prevent scratching.

Hydrogen peroxide (one part to four of water) is advised for the mouth, followed by Listerine (one in eight).

Feer advises the use of atropine in increasing doses. He says it does not increase the pulse rate further, and relieves many of the distressing symptoms. Atropine ointment may be used for the skin.

In cases with marked neuro-muscular weakness strychnine and arsenic may be given with benefit.

Fresh air, of course, is a necessity, and in the summer cases do well on balconies or sleeping outside.

Numerous other drugs have been advocated from time to time, but their value is problematical. Calcium lactate and thyroid are useless.

Sweet strongly advises the use of the mercury vapour quartz lamp, starting with an exposure of three minutes at 90-100 cms., and gradually increasing the duration of the exposure and lessening the distance from the lamp. This is preceded by radiant heat for five minutes. Treatments are given at intervals of three days, and Sweet claims cure in nine treatments on /

on an average. The first signs of improvement are alleviation of the misery and insomnia. The most resistant features are the condition of the extremities and the muscular weakness.

Many other writers confirm these results, but in Newcastle this method of treatment has been found disappointing.

It is difficult to assess the value of any particular treatment in Pink Disease. This applies to the ultra-violet light treatment and also to other methods which have been advised.

Thus McLendon claimed great benefit by giving one case irradiated ergosterol (five drops daily) and yeast cake (one half daily) in addition to an abundance of vitamins. Zahorsky also reported improvement in a case on the administration of yeast.

Lapage advised injections of tuberculin, with which he claimed good results in five cases.

The latest vogue is liver treatment. Wyllie and Stern gave 2 oz. of pounded liver, mixed with milk or port wine, daily, and claimed remarkable results in at least one case.

Vipond's vaccine has not been taken up with any enthusiasm.

One's frank opinion is that none of these special methods help in any way the natural tendency of cases to cure themselves, provided secondary infections /

infections can be avoided.

These complications, when they do occur, are to be treated in the usual way. Surgical intervention may be required for the tonsils or nasal sinusitis, and the frequency of intussusception must not be forgotten.

To recapitulate, the principles of treatment are -

- (1) Nursing - making the patient as comfortable as possible, allaying the irritation, and trying to procure sleep.
 - (2) Nourishing diet and fresh air.
 - (3) Protection from secondary infections.
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S U M M A R Y.

1. Pink Disease is a new symptom-complex chiefly seen in babies of from three to eighteen months. Ten personally observed cases are recorded in detail.
 2. The symptoms are characterised by -
 - (a) a condition of extreme misery, insomnia, irritation, sweating and photophobia;
 - (b) skin rashes with erythroedema of the hands and feet;
 - (c) extreme muscular hypotonia.
 3. The condition is probably of an infective nature, and may be due to a neurotropic virus akin to that of epidemic encephalitis. The mesencephalic centres of the sympathetic nervous system are affected, and changes also occur in the spinal cord and peripheral nerves. The cerebral cortex appears to escape involvement in the great majority of cases.
 4. The mortality is by no means low, and has been placed as high as 30 per cent by some writers. Death is usually due to secondary infections, but may occur suddenly and unexpectedly.
 5. The main necessity in treatment is skilled nursing.
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